

THE IRON AGE

APRIL 13, 1933

ESTABLISHED 1855

Vol. 131, No. 15

Training the Sales Telescope on Tomorrow's Markets

By JOHN H. VAN DEVENTER

Editor, The Iron Age

The current article is the thirteenth in our general series devoted to Modern Merchandising and Marketing in the Metal-Working Industry.

THE story is told of a tramp who went to sleep one night on a haystack. During the night there was an earthquake of major proportions, but the weary sojourner, tired by the previous day's peregrinations, cushioned by the hay and possibly made somnolent by a pull or two upon a potent potion before retiring, slept peacefully through the disturbance. Next morning, wakening upon an altered world he rubbed his eyes in wonder. For a recently adjacent barn had completely disappeared; where the sun had set last night behind a mountain there was now a valley; at his feet ran a river where before there had been a dry cornfield.

"My," exclaimed the peripatetic pilgrim, "how things have changed around here!"

Earthquakes alter landscapes. Economic earthquakes are no exception.

If any of us had been so fortunate as to have slept undisturbed through the past three years and had awakened today, he or she would be amazed at the changes that have taken place in the economic landscape due to the series of jolts that have shaken us. Having experienced these changes gradually, we do not realize the drastic alterations that have taken place.

These alterations have completely changed our economic landscape. They will affect the lives and actions of every one who makes, sells or buys in the years to come. They are of particular import to you who are here tonight, for you must find your sales roads, or build new ones, upon and among the debris of altered or demolished markets.

THE sweeping economic changes of the past three and one-half years have placed a premium on adaptability. Old rules, old precepts, have gone into the discard. Industry must again get its bearings in an altered world. Its greatest task will be to perfect its distribution machinery. The new demands that merchandising will make upon the executive are outlined in this article, which is an abstract from an address before the Cincinnati Association of Industrial Marketers on March 31.

Let me introduce to you, to help the visualization, Mr. Rip Van Winkle, Jr., who went to sleep in September, 1929, and woke up a few weeks ago.



Rip is, or was, a salesman. On the eve of his 3½-year nap he had returned from a trip to his factory where he had gone to attempt to expedite the delivery of orders for some of his customers. Not having been able to secure a lower berth or a compartment or drawing room on two days' notice on any one of the three sections of the Century, he had sat late in the smoking compartment, observing through the window, as the train sped past towns and cities, the myriad lights of the many factories operating on night shifts. Lighting a Corona Corona, Rip placed his twenty dollar shoes upon the adjacent seat and comfortably smoothed the vest of his hundred dollar suit in the vicinity of a recent three dollar meal. The world was a pretty good place, reflected Rip, glancing at his order list, especially since the coming of the new prosperity era. Nowadays, a good man could get what was coming to him. If not in one place, then in another. Witness the three offers he had in his pocket from competing firms who recognized a good man when they saw one.

Rip arrived at the office next morning in time to write and thank six customers who had mailed sizeable orders during his absence, and then argued the boss into giving him a thousand dollar raise on the strength of his offers from competitors. On the way home, he stopped and made a deposit on a new custom-de-luxe sport model coupé. Then he went home and went to sleep. Being a Van Winkle, he made a good job of it. He slept for three and a half years.

When he awoke next morning, or at least it seemed to him to be next morning, Rip heard newsboys shouting on the street under his window. "President Roosevelt closes all banks in the United States." "That newsboy must be crazy," thought Rip, rub-

bing his ears. "Teddy Roosevelt went out of office in 1909."

Determining to get a paper and see what it was all about, Rip jumped out of bed and hurriedly dressed. When he reached the street, he found that the newsboy had disappeared. Glancing at the window of the haberdasher from whom he had bought his \$100 suit the week before, he saw its replica on exhibition. On it was a placard with the words "\$17.50, alterations \$1 extra."

Next door was the restaurant where Rip was in the habit of breakfasting—or had been. Now it was a vacant place with a "to let" sign in the window. As he wandered down the block, Rip noticed that fully half of the stores were vacant. "Strange," he thought, "only a few days ago space in this locality was at a premium."

Losing all appetite for breakfast, Rip hurried downtown to the office building in which his company made its district headquarters. Here, too, he experienced a shock which made him doubt his own senses. Gone was the ornate gilt lettering which announced that within was to be found the exclusive Eastern representation of the P. D. Q. Mfg. Corp'n. Indeed, overnight, these letters had changed into "Cohen, Cohen, Cohen & Cohen, Attorneys, Collections a Specialty."

Rip and His Blue Chip Stocks

Finding himself, overnight, so to speak, without a job did not bother Rip as much as it puzzled him. For he had been canny in business matters. He had accumulated a respectable bank account and some nice blue chip stocks. He should worry!

What the newsboy had shouted that morning had slipped his mind. "Guess I'll go to the bank," said Rip, "and get some cash." So he beat it to the XYZ Trust Co. But the ornate bronze doors which heretofore had connoted the spirit of stability and safety were shut. And upon them was a little card announcing that the bank was in process of liquidation and in the hands of the State superintendent of banking. Inquiry at the adjoining cigar stand revealed the unannounced fact that the bank president and principal officers had recently become guests of the State prison warden.

Somewhat staggered by developments, our friend Rip turned, in last resort, to the blue chip nest egg. Quickly he took a newspaper from the newsstand and turned to the financial page. How could he believe his eyes? Here was New York Central, for which he had paid 237 a few days ago, now listed at 20. Here was United States Steel, which had closed last night at 256, now at 32½. And he had bought these stocks expecting to double what he had inside of six months.

Stunned and shocked and in need of stimulation, Rip reached in his pocket for a Corona Corona. Last night he had filled his cigar case



with them. But they did not look the same. Examining the labels, he experienced the final shock. For the Coronas had turned to Cremos!

Presently we will take leave of Rip, for he has served our purpose in portraying a few of the mighty changes that have come about. Suffice it to say that it is well for us, perhaps, that we have come into our present condition gradually; that we have had adversity thrust upon us not suddenly, but by degrees. The gradual process may have obscured the contrast between conditions then and now, but at least it has given us time to get acclimated.

The Turnover in Industry

If Rip, an industrial marketer, had not jumped off a bridge on the afternoon of the day on which he awakened into a new and altered world, we might have accompanied him on a trip through his sales territory, provided he had found a job. What would have impressed him above all, on this first trip, would not have been the difficulty in making sales, or the fact that even "hand to mouth" buying had abdicated in favor of "chin to lip" purchasing. Nor that the normal usage in credits and collections had been violently uprooted. Nor that the buyer set the seller's price. Nor that the manufacturers seemed eager to forget all profit and in addition to present the buyer with a few dollars drawn from surplus as a premium on purchases.

Strange as these practices would have seemed, the strangest of all of his experiences would have been the great turnover in customer contacts. Familiar faces were gone—scattered, as it were, to the four winds, and in their places were strangers "who knew not Joseph." Old companies which he had known and contacted for years were padlocked by business prohibition. Old timers who had known his sales story as well as he did, who knew the advantages and limitations of his product perhaps better than he had known them, were



no longer at their accustomed desks in surviving plants. Their places had been taken by younger men who were primarily quotation takers, or their functions were taken over by higher executives whom Rip had never met. A big sales job to do all over again with perhaps 30 per cent of his prospects, due to turnover of personnel. And this, in addition to a vastly more difficult selling problem due to the radical turnover in thinking which had frozen the customers' will to buy. A coat of armor surrounding buying influences and buying authority, invisible but real, mental but as impenetrable as hardened steel, built up, layer upon layer, by 42 months of retraction, retrenchment, reduction in never ceasing economy, retreat. And sellers, suffering from the same economy psychosis, pecking away at this new resistant barrier with sales tools of far less power and efficiency than were used in the easy times before these barriers were built.

Time to Take Off the Brakes and Step on the Gas

The car of business has been going down a steep hill for three and a half years. Management has been putting on the brakes so long and so continuously that in many cases the wheels of organizations are locked. It was necessary to use the brakes, the economy brakes, on all four wheels to keep us from running into the ditch of deadly deficits. Also, in descending this continuous decline, there was, apparently, nothing to be gained by feeding sales fuel to the motor. So the sales gas was turned off and promotion allowed to coast.

Boards of directors, company officers, executive committees, bankers interested in industry, set the economy brakes. They ruled that there must be a minimum of expenditure, in other words of buying. Economy became the watchword and the slogan for appropriations became the famous French World War expression of Verdun. You remember it. "They shall not pass."

But every situation has two sides to it. In ruling that there should be a minimum of buying, the directing forces of industry and business automatically ruled that there should be a minimum of selling. Ruthless economy, viewed from the rear, spells business suffocation.

Of course, with characteristic American individuality, each organization expected to be the exception. It wanted to curtail buying but to keep on selling. But there were too many similarly minded individualists. And so rugged individualism became ragged collectivism—a collectivism of retreat. Nobody bought; hence, nobody sold.

Now mind you, I do not question the use of the economy brakes in going down hill. They were necessary. My point is this: Once the bottom of the hill has been reached, the brakes must be released and gas fed to the

motor if there is to be any hope of climbing the upgrade ahead.

We are on the bottom now, there is no doubt about it. The one direction that we can go is up. The trouble that we are going to experience in getting sales moving again is that many of our prospective customers have kept the brakes on so long that they have forgotten how to release them. Many of them will wait, in vain, for President Roosevelt to come along with Uncle Sam's ox team and pull them up the hill. "God helps those who help themselves" and the Government won't help those who can and don't.

Our problem is not to condemn economy, for true economy will and should be the watchword for a long time to come. Our problem is to define true economy and to expose false economy. There is economy blindness as well as color blindness.

An Example of False Economy

The economy and retrenchment psychosis which has affected the mind of industry and business has lost its power of discrimination. There is no better example of this than in what has happened to the machine tool industry.

What would you think of the intelligence of a community visited with a pestilence, which would refuse to pay the small fee required for a known and recognized anti-toxin which would provide immunization and relief? Unthinkably false economy, of course. But not more unthinkable than the actual experience of the machine tool industry.

From 1900 to 1922 we increased our national wealth in the estimated amount of 232 billion dollars. Two and a half times as fast as our increase in population. How was this done? By hocus pocus, financial legerdemain, legislative wand waving or taking land from the Indians? Nonsense. Every dollar of that increase above and beyond the normal due to growing population came through the more efficient transformation of nature's raw materials into finished products for man's consumption. How did we get more efficiency? Primarily through improved machinery, through cost reduction, through making the buying dollar go further because of the progressive cost reduction of both agricultural and industrial products. Prosperity is not a hand-made product; it is machine made. And the machine tool is at the root of it.

Yet in the light of this experience, what happened? During the past three and one half years, we have lost an estimated 80 billion dollars of national wealth. Did our industries, to compensate for this, turn to the wealth-creating anti-toxin which would have counteracted the ravages of this wealth-devouring pestilence? Did it take advantage of the improved machinery which would have offset this loss through progressive cost re-



duction? Ask the prostrate machine tool industry, now flat on its back with a sales deficit of more than 100 million dollars since the depression—an industry, which, if the industrial public differentiated between true and false economy, would now be working overtime providing the wealth-creating means to make up our staggering losses.

Truth and Simplicity

We must get the brakes unlocked before we can start climbing the hill. The biggest and toughest sales job that we have ahead of us is not merely to convince our prospects of the superiority and desirability of our products. Many of us have already done that and yet it does not result in sales. We cannot buck the universal need for economy in these days of reduced corporate and individual incomes. What we can do and must do is, first, to become converts ourselves to the doctrine of true economy and then to become ardent and intelligent missionaries who will carry this doctrine and belief to our prospects.

The "buy now" and "buy more" campaigns failed, as they should, because they did not discriminate between true and false economy. Neither you nor I believe in them; they did not ring with truth.

Truth is based upon knowledge. And knowledge changes with the times. If we are to be armed with the truth that will carry real conviction to our customers today, we must all go to school again. We must forget many of the things that we thought we knew about selling, about our products, about our prospects, about our customers, about our competitors. For these things have changed, in themselves and in their relationships. We must catch up with them.

Propaganda has no appeal today.



Former prestige has largely lost its force, for the public has seen some of the mighty fall from their pedestals. The varnished and decorated fragment of truth which may have served as a sales message yesterday will be unheeded today and tomorrow. Complexity of thought and expression is in the discard. Our people are surfeited with deviousness and ambiguity. But they are hungry for truth and simplicity of expression. Witness the technique of that master salesman who is our new President. Let's take a lesson from it to apply in our own businesses.

High Wages and Prosperity

While we are talking about false economy, let me say a word or two about wages. There has been much controversy on this subject. It seems to me that there is a common-sense way of looking at it.

Most of us have favored the highest possible wage consistent with a living wage for invested capital, not merely from a humanitarian standpoint, but from the practical standpoint that wage earners comprise our largest collective market. If we are going to sell lots of automobiles or shoes or breakfast foods or what have you, we must look to the wage earners for our principal market.

On the other hand, wages must bear a definite relationship to the obtainable prices for the goods that the wage earner makes. It is futile for management to say, "we will pay not less than so much per day to our workers," unless it also declares, "we will accept not less than so and so much from our customers in the way of price." Suicidal prices must inevitably mean starvation wages.

But the wage question goes deeper than these obvious generalizations. As Lincoln said, "This nation cannot endure half in slavery and half free." It is equally true that no economic equilibrium can be maintained so long as the bricklayer, hod carrier or other member of an organized trade can command through dictation a day's pay of four or five times the amount paid to the farm laborer or other unorganized worker. Unjustified pay differentials, secured by mass pressure, restrict instead of broaden markets. Our future prosperity lies in the buying power of the average consumer, not the exceptional and restricted classes.

The new deal in the interest of the forgotten man must consider the interest and buying power of the man outside of the labor union as well as the man inside of it.

Because you are vitally interested in marketing and because the wage earner will constitute, directly or indirectly, a major factor in your future markets, I want to dwell a bit longer on this matter of wages.

You have heard many explanations as to the cause of the depression. Most of them ascribe it to over-

Trend of Sheet Mill Mechanization

By J. FRANKLIN MILLER
White Engineering Co., New York

IN undertaking this study of an entirely mechanical mill for rolling sheets, one is immediately impressed by the efforts of mill owners during the past five years to overcome the handicaps imposed by the manually operated mill. The mechanization of these mills has progressed backwardly from the finishing end of the plant toward the roughing side. This, of course, is entirely reasonable and proper, since with the advent of the continuous mill (which has been most successful on the heavier gages of sheet) and also owing to the installation of three-high roughing mills, mill owners have been compelled to mechanize finishing equipment immediately to care for the heavy increase in tonnage of roughed sheets.

Other mills which have not been fortunate enough to possess an adaptable plant layout, whereby, say a three-high rougher would reasonably fit in, have changed their layouts and use two ordinary roughers to feed one mechanical finishing mill. This method has naturally increased tonnages, but has not been of maximum advantage when considered from the angle of decreased costs.

Likewise, the size of the available sheet bar has kept many mills in the manually operated class. The 8-in. wide bar was the natural outcome of the demand for a sheet bar readily portable, and when rolling finished sheets of 30-in. width and 8-ft. length the bars were readily and quickly passed about. In order, however, to comply with demand of the automotive industry the size of sheets has jumped considerably, till now the demand is for 36, 40 and even 42-in. widths. The lengths, too, have steadily increased from 8 to 10 ft. and even to 12 ft. And it is indeed a superman who can roll or catch such sizes and weights as a regular diet.

Making Roughing Unit Mechanical

With the advent of demands for large sheet sizes it has been found practicable in many cases to roll 10-in. sheet bar on the same mills which formerly rolled 8-in. bar, and in several instances bar 12 in. wide has been rolled on the same mills by the addition of a final stand or by using a larger drive motor.

So with these thoughts in mind we are pushing onward to make a mechanical mill of the roughing unit;

tearing it out of the old-style roughing, finishing, roughing rotation of the conventional two-high train; and of interposing continuous pack furnaces between the two mill trains, and of installing a continuous bar furnace in front of the roughing mill.

The description which follows recounts the details of the way in which this general idea may be accomplished. These ideas are in line with present trend to design a mill as wholly mechanical as possible, thus raising tonnages to new highs, to accede to an enormously varied demand as to physical and chemical properties, and to meet the strict specifications prevailing in this day and age. In addition, this design aims to permit entire flexibility of size and gage requirements within its range; and will require a smaller mill crew, thus assuring economies of cost per ton of product. The design retains the simple two-high type of mill stands throughout, and the plan can readily accommodate items of existing equipment.

A complete mill unit as indicated consists of two half-units of roughing equipment and four quarter-units of finishing equipment.

Roughing

A half roughing unit consists of one double-row continuous-type furnace for heating bars (on one conveyor), and for heating matched packs of two, three or four bars (depending upon final gage) on the adjacent conveyor. The roughing stand is located on the outside and the run-over stand on the inside of the half



unit. Between these stands is located a compound gear set which reduces the speed of the roughing mill and also contains a set of pinions for driving the rolls of the roughing mills, thus making a balanced type mill.

Behind the roughing mill back table is a mechanical matching table whereon the roughed bars are both side and end matched, and then removed to a conveyor and returned to the charging end of the furnace for reheating.

The runover mill is a jump-type mill of standard design and is followed by a mechanical doubler located directly in the line of tables.

The front and back mill tables at both the roughing and runover mills are along the lines of the conventional swing type now generally in use on finishing mills, but with improvements for handling the short widths of bars. This type of table has been popularized by the Wean Engineering Co., which is credited with 30 installations in use on finishing mills.

Beyond the doubler, packs are moved over a castor bed to the charging ends of the finishing furnaces.

Finishing

A quarter-unit of finishing equipment consists of a double-row continuous-type pack heating furnace, followed by a driven-roller converging table. The front and back mill tables are similar to those used at the roughing end except that they will accommodate longer packs.

The finishing stand is a simple two-high stand of chilled rolls, and the four stands are driven by a centrally located unit.

Following each finishing stand a cooling wheel is located, and each two cooling wheels discharge to a common table followed by a roller leveler, and thence to a conveyor to the shear building.

Range and Method of Rolling

A sheet mill of this type will roll all gages from 10 to 30; and will roll lighter than 30 gage if a doubler and shear be installed together with a return conveyor behind each two finishing mills, for returning packs to the finishing furnaces for reheating.

Widths are preferably 30, 36 and 42 in. Lengths 8, 10 and 12 ft.,

light gages (28 and 30) probably not over 10-ft. lengths.

Generally speaking, sheets heavier than 18 gage may be run directly from the roughing stand to the finishing furnace without doubling.

In general, the method of rolling will be as follows: Single bars are heated on the inclined fingers on the inside conveyor of the roughing furnace, the conveyor traveling at a slow rate so that a bar drops from the furnace at regular and predetermined intervals, dependent upon time requirements in the roughing mill. The bar from the furnace traverses the cross conveyor, and its direction is changed on a ball bed located at the end of this conveyor. Ball bed tips up and discharges bar to gravity table, and thus to the front roughing mill table. This table is equipped with side squaring guides and an automatic stop arranged to prevent more than the required number of bars being on the table at one time.

The bar enters the mill and, after taking the pass, both front and back tables are raised and reversed and the piece is carried to front side of the mill over the top roll. The tables are lowered, and reversed, piece squared, and released to the mill for another pass. After the proper number of roughing passes, usually two, the piece is run out on the matching table. The total time required for these passes for bars forming one pack will be between 12 and 40 sec.

After the second bar has received

THE present trend in the sheet mill is along the lines of complete mechanization, and to that end the author offers the accompanying study to show the most logical outcome of present intensive effort in that direction.

The article is not devoted to the practice in any one plant at this time, but contains conclusions drawn from various studies over the past two years. To date none of the older plants has been completely mechanized, although the finishing equipment of many has been so transformed.



the proper number of passes it is run back to the matching table and underneath the first piece. The third and fourth bars, as the case may be, are similarly ranged on the matching table, the last piece always beneath the piece preceding. When the pack is completed, and is end and side matched, it is then pushed by moving fingers to the return conveyor, and thence to the outside line of flights of the bar and runover furnace.

The runover packs leave the furnace and proceed direct to the runover stand, and receive two or three passes as required and consuming between 15 and 32 sec. The tables manipulate the packs similarly to those at the roughing mill. On this

mill, the front tables only are equipped with side-centering guards. Behind the back mill table is located a runout table for temporary storage to prevent clogging at the doubler.

The doubler is of heavy construction, such as would be capable of doubling a cold pack of maximum thickness. The platens of the doubler will be slotted for non-rising disk rollers, and with centering fingers for the packs.

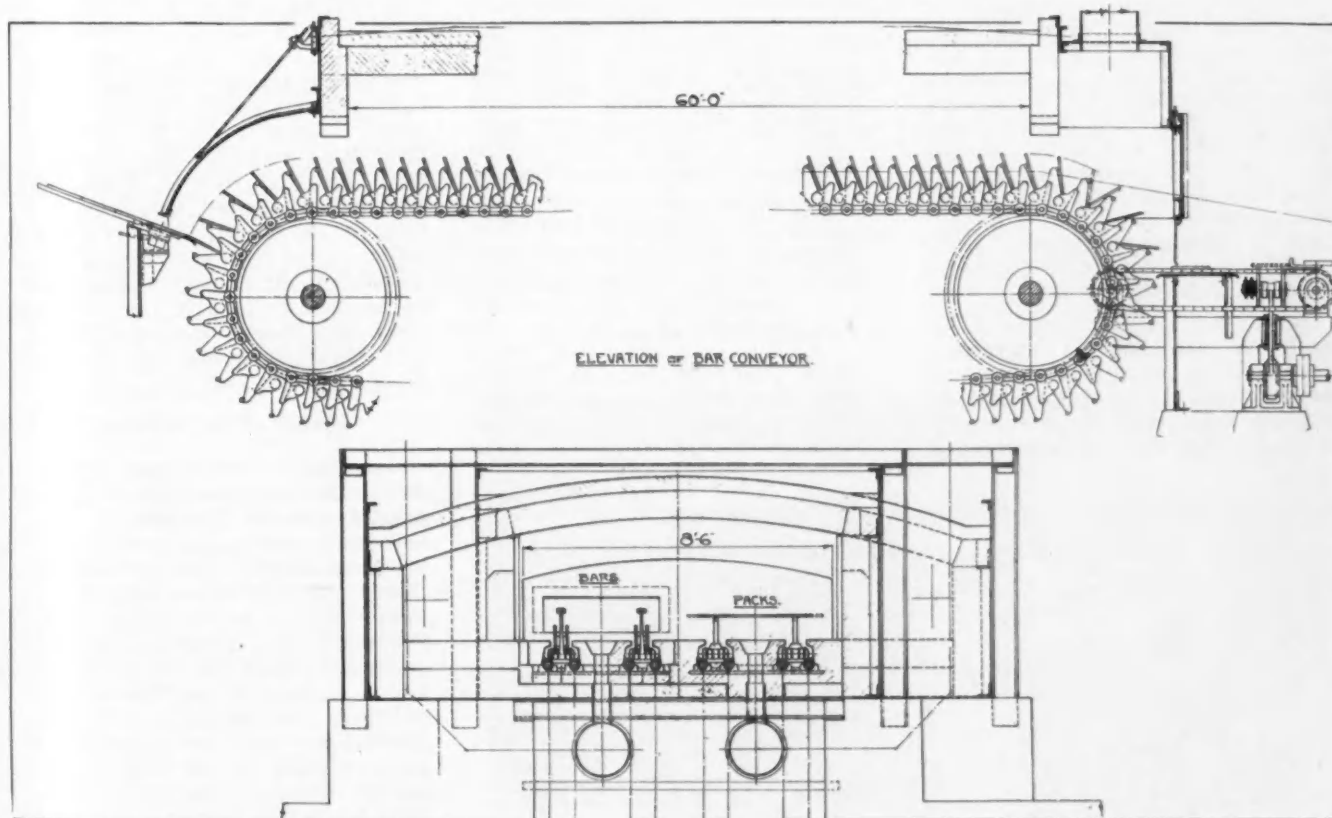
A ball castor bed is located in front of the finishing mill furnaces, over which the doubled packs are moved to the proper furnace conveyor.

Finishing mill or pack furnaces discharge to a set of driven disk rollers, thence to a driven converging table, and so to the front finishing mill table. The front and back mill tables are similar to, but faster and longer than, those of the preceding stands.

Three, four or five passes, as required, are given in the finishing mill and the pack proceeds to a runout table in front of the cooling wheels. The time required for passes in this mill will be between 25 and 75 sec. Packs are passed back to the front side of mill by mechanical tables, as on the previous stands.

Pass Requirements for Various Gages

The pass schedule for various gages will approximate the data in Table I. It will be preferable to use sheet bar of 10, 12 or 16 in. width. However,



Compound sheet mill, roughing furnace, bar conveyor and furnace cross section.

tables and rollers can be designed for the use of 8-in. bar.

For finished sheets 10 ft. long and 36 in. wide, the heaviest bar will weigh 133 lb., for 18-gage sheets. This would give an equivalent thickness of 1.26 in. for 10-in. wide bar, of 1.05 in. thick for 12-in. bar, and 0.79 in. thick for 16-in. wide bar.

The lightest bar will weigh 34 lb., for 30-gage sheets, and this will be equivalent to thicknesses of 0.315 in. for 10-in. bar, 0.263 in. for 12-in. bar, and 0.1975 in. for 16-in. bar.

Reduction in the Passes

The average size bar will approximate that used for 24-gage sheet, and will weigh 67.7 lb. For a final sheared length of 10 ft., a bar 12 in. wide will have a thickness of 0.535 in. The passes will approximate the figures shown in Table II. While the percentages of reduction on the two roughing passes may appear abnormally high, it must be remembered that the roughing mill is turning at a slow speed and that the rolls are probably of somewhat larger diameter than those of the ordinary mill, and also that both top and bottom rolls are driven through the pinion stand, so that the action on the bar becomes, in reality, more of a forging, rather than a rolling operation. Since these heavy reductions take place at a heat well above the critical temperature of 1200 deg. F., the steel will lack the brittle hardness and elongated crystal structure which takes place in the metal at lower temperatures.

In order to keep the steel well above the critical temperature at all times while rolling is in progress, it has not seemed advisable to undertake five or more passes on a single heating. Therefore, two reheats have been indicated, and it is believed that with this method it will be easier to meet the rigid specifications now prevailing, and it should be possible to eliminate annealing on a larger tonnage than has heretofore seemed practicable.

Since the roughed bars will go back for reheating on high-speed conveyors and at a temperature approximating the critical point, the runover heat really becomes merely a wash heat. As the roughing and

Gage	No. Bars Rough Per Mill	No. Pack Passes	Match	Reheat for Run-overs	Run-over Passes	Double to Packs of	Finish Passes	Total Passes	Weight 10 x 3 ft. Sheared Pack, Lb.
14	2	2	2's	no	none	not d'bl'd	3	5	187.5
16	3	2	3's	no	none	not d'bl'd	4	6	225.0
18	2	2	2's	yes	2	4's	3	7	240.0
20	2	2	2's	yes	2	4's	3	7	180.0
22	3	2	3's	yes	3	6's	3	8	225.0
24	3	2	3's	yes	3	6's	4	9	180.0
26	4	2	2 & 2	yes	3	8's	4	9	180.0
28	4	2	2 & 2	yes	3	8's	5	10	150.0
30	5	2	2, 2 & 1	yes	3	10's	5	10	150.0

runover passes are given on separate stands the flow of material will be continuous, time cycles for each part balancing, and there will be little lost time involved for either stand.

The runover stand will be equipped with 30-in. diameter rolls running at 25 r.p.m., and the reductions indicated should be made without inconvenience, since the steel is again well above the critical temperature.

It will be necessary to use a water spray roll-cooling system and to wipe the rolls so that the hot bars do not come into contact with excessive moisture.

Estimated Tonnages for Various Gages

Based on finished sheets 36 in. wide, and 10 ft. long, it is conservatively estimated that one complete mill unit will produce the following annual tonnages (800 shifts of 8 hr. each):—

14-gage sheets....	175,000	gross tons
16-gage sheets....	160,000	gross tons
18-gage sheets....	140,000	gross tons
20-gage sheets....	120,000	gross tons
22-gage sheets....	110,000	gross tons
24-gage sheets....	100,000	gross tons
26-gage sheets....	90,000	gross tons
28-gage sheets....	70,000	gross tons
30-gage sheets....	55,000	gross tons

Based on rolling 24-gage sheets:—

3 shifts per day—800	
shifts per year...	100,000 gross tons
2 shifts per day—575	
shifts per year...	75,000 gross tons
1 shift per day—300	
shifts per year...	40,000 gross tons

Mill Crew

On a production basis of 24-gage sheets (3 x 10 ft.) the annual output will be 100,000 tons for one complete unit. For this output the crew

will consist of 40 men. Numbers in circles on the mill plan indicate the positions of these men.

One hundred thousand tons in 800 shifts means 125 tons per shift. With 40 men in the crew, output is 3.125 tons per man per shift.

Because of the fact that heretofore there has existed no entirely mechanical mill, there is no precedent for the basing of labor rates. Without doubt new ton rates will be effected in such a manner that, while the rate per ton will be decidedly lower, the workman's wage will be largely increased over the present standard of compensation owing to the enormous jump in production per man.

Several of the men of the mill crew are of low-grade labor, such as bar passers, bar and pack chargers, matcher, pack opener, doubler, and conveyor operator. These embrace a total 24 of the 40 men required.

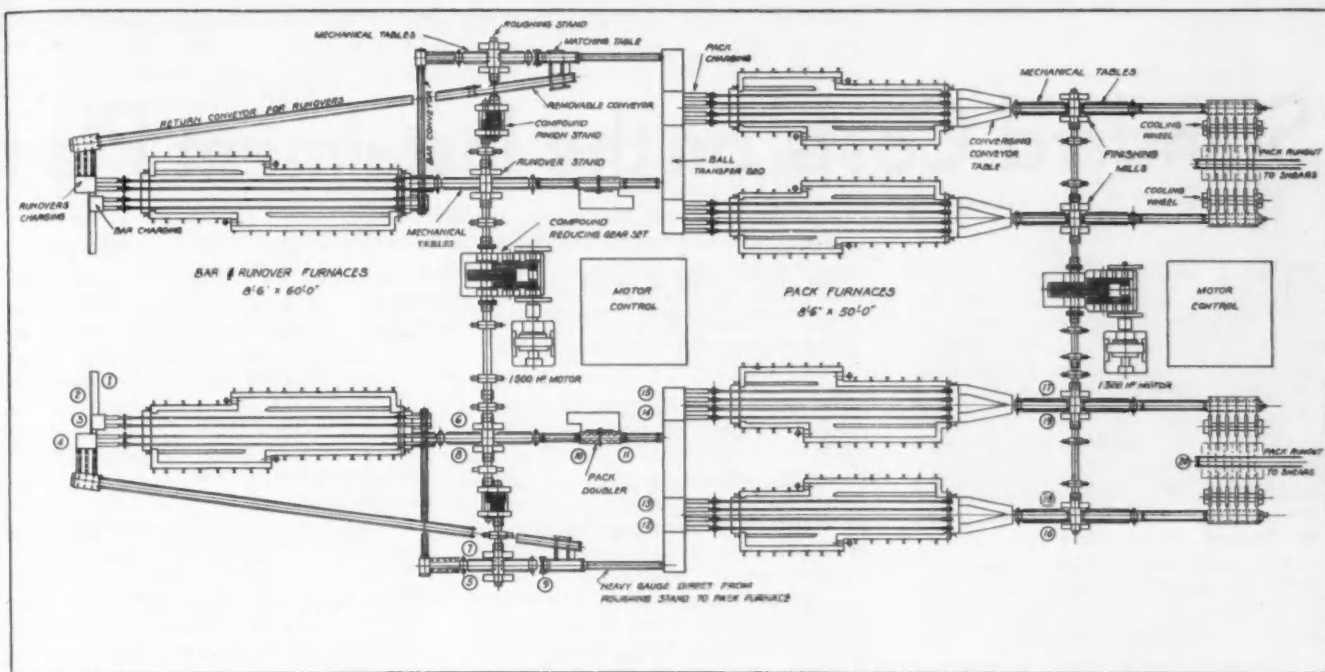
A higher grade of labor will be required for screw man. This will cover eight more men of the crew. The high-grade labor consists of the eight rollers. It is estimated that for rolling 24-gage, 3 x 10 ft. sheets, the total labor cost will be: Roughing, \$1.05 per ton; runover, \$0.95; and finishing, \$1.35 per ton, making a total of \$3.35 per ton. Shearing labor has not been considered in this connection, since sheets will probably be handled in quantity on either a continuous sheet shear, or with tandem arranged shears of standard types.

Design of the Furnaces

Owing to the heavy tonnages handled it becomes necessary to put a greater tonnage through the furnace than could be accommodated by the conventional double-strand continuous furnace, unless the furnace were built to an excessive length. For this reason a furnace has been designated which will have the essential features of the Flinn & Dreflein type, but one in that the bars are not laid flat, but placed at an angle of about 60 deg. from the horizontal. Bars will be spaced at approximately 7-in. centers, and by this method the tonnage is raised and the bars are allowed to heat for a longer

TABLE II—Reductions and Temperatures of the Passes

Pass No.	Thickness of Piece, In.	Per Cent Reduction	Length In.	Pack Thickness, In.	Draft, In.	Approx. Bar Temp. Deg. F.
Bar	0.535	...	12.	0.2675	0.2675	1650
1	0.2675	50.0	23.9	0.2675	0.1203	1550
2	0.1472	45.0	43.3	0.1472	0.1203	1500
Match	3's	...	...	0.4416	...	1100
Reheat	...	...	43.3	0.2829	0.1587	1550
3	0.0943	36.0	67.4	0.1968	0.0861	1475
4	0.0656	30.5	96.9	0.3936	...	1425
Double	packs	...	...	0.2562	0.1374	1000
Reheat	...	...	48.2	0.192	0.0642	1450
5	0.0427	35.0	73.5	0.1632	0.0288	1400
6	0.0320	25.0	98.0	0.1470	0.0162	1375
7	0.0272	15.0	115.0	...	...	1325
8	0.0245	10.0	128.0	...	...	1250



- (1) Bar passer. (2) Bar passer. (3) Bar charger. (4) Runover charger. (5) Roller. (6) Roller. (7) Screw man. (8) Screw man. (9) Matcher. (10) Pack opener. (11) Doubler. (12) Pack charger. (13) Pack charger. (14) Pack charger. (15) Pack charger. (16) Roller. (17) Roller. (18) Screw man. (19) Screw man. (20) Conveyor operator.

period than is now common practice. A sketch showing a bar conveyor of this type is here reproduced.

The pack furnace is entirely sim-

ilar to the standard type of finishing furnace now in use on the "combination system," except that waste gases will be drawn off from beneath the

packs and so maintain a hotter bottom. There are approximately 130 of these continuous furnaces now in use.

Stainless Clad Steel Milk Truck Has 3000-Gal. Capacity

DISTRIBUTERS are now turning to stainless clad steel as a solution for their problems in transporting milk by truck. The requirements are that the inside surfaces of the material used in tanks and all of the inside seams must be smooth so the tanks can be easily and thoroughly cleaned to prevent contamination. The material must also be resistant to wear and it must not crack, chip or corrode. Further it must leave no taste in the milk.

Tanks meeting these specifications are being fabricated by the Alloy Products Corp., Waukesha, Wis. The milk tank shown in the accompanying illustration is of 3000-gal. capacity, that is it will hold 15 tons of milk. It is elliptical in cross-section and measures 60 in. by 77 $\frac{1}{4}$ in. by 18 ft. 11 in. in length. The tank sheets are 10 gage, 20 per cent of the thickness being stainless steel which was polished before shipment to the fabricator.

This tank was made of five sheets and two end pieces. To assemble these parts there were required six circumferential seams and one longitudinal seam, making in all 230 ft. of arc welding. Because of the requirement that the tank be smooth on the inside

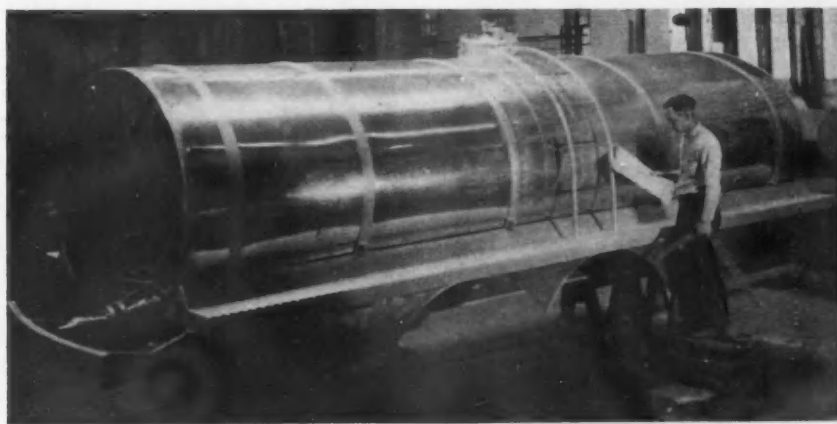
great care was taken in laying out, cutting and welding the various units. Each circumferential sheet was scratch awl marked at the points where the tank axes cut through the sheet. The longitudinal seam on each sheet was then welded and the sections then were placed together, preparatory to welding the circumferential seams. A strict requirement was that the awl scratches on adjacent

sections should match within very close limits.

The welder first tacked the seams on the inside and then welded from the inside with a 25-12 chrome nickel rod which was coated. The welding having been completed on the inside the welder, using the same composition rod, welded the seams from the outside.

Tests show that the weld is free of iron so that when the inside surfaces of the welded seams are ground and polished only an unbroken stainless steel surface can come in contact with the milk.

(Concluded on Page 593)



This stainless clad steel tank is being used to transport milk by truck. A load consists of 15 tons, or 3000 gal. of milk.

Standard Costs on the Instalment Plan

THE last two or three years have tested the cost accounting systems as well as other procedures and policies of industry. The futility and uselessness of "actual" cost systems have become apparent to industrial concerns that may have been employing them during this period. The results from such cost methods are useless for purposes of pricing the product, as selling prices based on "actual" costs could not possibly create any sales in a competitive field; and to price inventories at "actual" cost is simply to overstate the profit or understate the loss.

The term "actual cost," as used in the foregoing, applies to that type of cost which absorbs all overhead expense and excess labor and material expenditures regardless of current commodity prices and volume of production. As opposed to "actual" cost systems the so-called standard cost systems have become widely adopted during the last decade or so, and when properly installed they have proved to be sound and of utmost utility. Not only do they yield useful cost figures for establishing selling prices and evaluating inventories, but they also point out inefficiencies, thereby making it possible to reduce losses.

While some manufacturers have hurriedly converted their accounting systems to a standard cost basis, others have hesitated, either because they are not thoroughly familiar with the principles of standard costs or because they feel that the cost of installing a new system is prohibitive at the present time. Considerable data must be collected, carefully analyzed and classified. Frequently, certain plant routines must be altered to obtain the necessary physical control of inventories and production. To do all this preparatory work for a plant of any size takes considerable time and may involve expenditures for rearrangement of equipment, if not for the purchase of new equipment.

The fundamental concept of standard costs is not a complex one, although the procedures developed in any given case may be of a burdensome type if care is not exercised. The manufacturer of a limited number of simple products, whether in large or small volume, should not find it costly to change his accounting system; and the manufacturer of a great variety of items may find it quite feasible to change his system on an instalment basis, thereby spreading the cost over as long a period of time as he desires.

By WILLIAM V. LINDBLOM
Assistant Treasurer, Walworth Co.

It may be said that the fundamental purpose of standard costs is properly to evaluate inventories and therefore correctly to prepare balance sheets and profit and loss statements by eliminating from production costs the variations from normal costs due to abnormal or subnormal manufacturing operations, and by bringing to light deviations from predetermined procedures. The manufacturing operations comprise a series of stages in which materials are alternately in process of conversion or at rest. In a business which operates both foundries and machine shops these several stages may be as follows:

- 1—Raw materials—(at rest)
- 2—Making of castings—(conversion)
- 3—Rough castings—(at rest)
- 4—Machining castings—(conversion)
- 5—Finished parts—(at rest)
- 6—Assembling parts—(conversion)
- 7—Finished product—(at rest)

In those stages where the materials are at rest no change in value normally takes place. It is in the conversion stages that increases in value take place through expenditures for the conversion operations. It is, therefore, in these conversion stages that production costs are determined and in which the elimination of variations from predetermined standards must take place in a standard cost accounting system.

There are two methods of determining these variations. Each of the stages of manufacture enumerated above should be represented by an account on the books of the business. The accounts for the conversion stages are "in process" accounts, and for each of these accounts the follow-

ing statement is true: The value of the inputs to these accounts plus the value of the opening inventory less the value of the production is equal to the value of the ending inventory if the values are all determined on the same basis. This statement may be expressed as a formula in the following terms:

$$I + O_1 - P = E_1$$

The determination of the variations consists in evaluating three of these terms at standard prices, the fourth term being evaluated at actual cost, and finding the difference between the two sides of the equation. At the time of installation of a standard cost system and each month thereafter the opening inventory is evaluated at standard cost. It is usually desirable to evaluate the production at standard costs, as it distributes the work throughout the month. Therefore, either the inputs to the process accounts or the ending inventory may be selected as the third term to be evaluated at standard cost before solving for the amount of the variation. Frequently the evaluation of the ending inventory at standard costs represents the least work and should be the method most free from periodic profit and loss adjustments, particularly if the inventory is a physical one. This method will serve every need from a strictly general, or profit and loss, accounting viewpoint. For want of a better name it may be called the "Profit and Loss Accounting Method."

The profit and loss accounting method does not, however, yield as much data on the effective use of material, labor, and equipment as can be profitably used by the management. Therefore, the inputs are often selected as the third term of the equation to be evaluated at standard costs before solving for the varia-

CASTINGS IN PROCESS COST SHEET
"CAST STEEL VALVES"

Elements of Cost	Pounds	Material Cost	Direct Labor	Expense	Total Cost
Net metal	18,281	\$147.83	.....	.....	\$147.83
Molding and coremaking .....	.....	.....	\$175.50	.....	175.50
Foundry expense .....	.....	.....	.....	\$553.92	553.92
Net input at actual	18,281	\$147.83	\$175.50	\$553.92	\$877.25
Opening inventory at standard	4,532	32.84	40.29	130.75	203.88
Total	22,813	\$180.67	\$215.79	\$684.67	\$1,081.13
Production at standard	18,046	\$138.37	\$130.97	\$284.49	\$553.83
Ending inventory at standard	3,609	27.62	26.20	57.82	111.64
Total	21,655	\$165.99	\$157.17	\$342.31	\$665.47
Variation	1,158	\$14.68	\$58.62	\$342.36	\$415.66

ACTUAL cost systems are of little use during a depression, according to the author. Prices based on actual cost cannot possibly create sales in a competitive field, and inventories at actual cost overstate the profit or understate the loss.

The writer recommends the use of a standard cost system, under which variations in production costs that are due to abnormal or subnormal manufacturing operations are eliminated. This system also has the advantage of providing a comparison between actual and standard conversion costs, thereby disclosing inefficiencies. The author outlines a method whereby the transition from an actual to a standard cost system may be made in instalments, thereby overcoming the objections of those who oppose a change of method at this time because of the expense involved.

tion. In this method each element of input is priced at standard cost and compared with the corresponding actual expenditure. Thus, excessive use of material, labor, and machine time may be determined daily and inefficiencies disclosed in time to curtail further losses. Such savings may more than pay for the additional detail work required to prepare the information. This method may be called the "Efficiency Data Method."

In the foregoing paragraphs it has been assumed that one total variation figure only is to be determined. It is usually desirable to have some analysis of this figure, especially if the profit and loss accounting method is adopted. The first step may be the subdivision of the variation account into separate accounts for the variation of actual material used from standard, the variation of actual direct labor used from standard, and the variation of the actual overhead expenses from standard. This is accomplished simply by segregating these three elements in the working papers. Cost data should also be collected by departments so that the analysis of the variation account will give a general basis from which to attack the problem of cost reduction.

Basis for the Instalment Plan of Installation

The manufacturer of a great variety of items no doubt has an accounting system now which shows production costs and inventory values by groups or classes of product. It is possible to develop standard cost procedures for these several groups or classes one at the time. Careful consideration of each classification will lead to the selection of the particular one for which the standard cost accounting procedures should be developed first. This selection may be made on the basis of the class from which it is anticipated that the greatest benefits will be derived or on the basis of the ease and simplicity with which it is felt that the procedures can be developed.

For instance, in the case of a full-line manufacturer of valves and fittings the classification of the product may be as follows:

- Cast iron screwed fittings
- Cast iron flanged fittings
- Iron body gate, globe and angle valves

- Iron body lubricated plug valves
- Brass gate, globe and angle valves
- Brass fittings
- Cast steel valves
- Cast steel lubricated plug valves
- Cast steel fittings
- Nipples
- Malleable fittings

One of the fittings subdivisions may be chosen for the starting point if the selection is made on the basis of simplicity of procedures. If the plant organization is entirely unfamiliar with the concept of standard costs, this would probably be the better course to pursue inasmuch as the educational work could more readily be carried on while the defects of the projected plan were being eliminated and a smooth running procedure developed. While this course would prepare the way for the application of standard cost procedures to the more complex product classification a more attractive return might be obtainable from a subdivision such as the "Cast Steel Valves." The present volume of business in this classification might be so limited as to involve a minimum of detail and therefore permit the development of the procedures for this more complex product without confusion.

Tying in the Standard with the Actual Cost System

A product classification having been decided upon, and assuming that the profit and loss accounting method has been adopted, the standard cost procedures therefore may be tied in with the present accounting procedures as follows:

The actual monthly expenditures in total for raw materials, molding and coremaking labor and the foundry expenses are distributed according to current accounting procedures to all the "castings-in-process" accounts affected, including the one for the product classification selected for development of standard cost procedures. The production of good cleaned castings in the selected classification is priced at the predetermined standard cost by items and a monthly standard cost is determined for the total production. Any inventory of cores and uncleaned castings in the selected classification is priced at the proper standard costs. From the sum of the opening inventory (previously priced at standard cost) and the actual



charges to the castings-in-process account is subtracted the sum of the production priced at standard cost and the ending inventory priced at standard cost. The difference is the variation of the actual cost of production of the castings for the selected product classification from the standard cost of production. (See table.) This variation is usually charged to an account which appears below the gross profit line on the profit and loss statement. As the standards are applied and the variation determined only in the case of the castings-in-process account for the selected classification, it is seen that the costs for all the other classifications will remain at actual.

The value of the good castings produced, priced at standard cost, is charged to the "castings stores" account for the given product classification. All castings withdrawn from castings stores are priced at standard cost, and the previous inventory has been priced at standard so the remaining inventory is always on the books at standard cost.

There is also an account for the machining of all the castings for the given product classification. To this account are charged the castings at standard cost, the actual direct labor, and that part of the actual departmental expenses which is allocated to the given product classification. As production reports are received of the machined castings, each one is priced at the predetermined standard cost of all machined castings within the given product classification. The inventory of partly machined castings is priced at standard and, as the previous inventory was also priced at standard, the variation of the actual cost of machined castings from the standard cost is determined by algebraically subtracting the sum of the opening inventory and the monthly charges from the sum of the production and the ending inventory. This variation is usually charged to an account below the gross profit line, as in the case

(Concluded on Advertising Page 18)

Deoxidation in the Steel Making Process

THE chipping costs of billets from a 0.35 to 0.42 per cent carbon, nickel-chrome steel, comprising about 10,000 tons from type "C" ingots [Ingots, as explained in the first part of this article, that require about 15 per cent discard for pipe, with blow-holes sufficiently beneath the surface to be welded in subsequent rolling or forging] are plotted on the accompanying chart together with the manganese equivalents necessary to secure this type. This chart is typical of all grades. Heats with which there had been irregularities, such as running stoppers, undue time in the soaking pits, charged into the soaking pits cold, and similar things which might affect quality adversely, are not included in any of these considerations. Chipping costs, on a considerable number of heats, constitute a fair index of the quality of the steel, when heats involved in the accidents of steel making are not considered along with those normally produced.

Time Element in Deoxidation

The next step, which required considerable time and the observation of a large number of heats, can be summed up briefly: Deoxidation, if it is to affect favorably the quality of the steel in other than its mechanical shape in the ingot, requires, as a minimum, one hour of contact between the molten steel and the deoxidizers. It may be considered from another point of view. *Quality is best obtained by reducing to a minimum the necessity for deoxidation.* In other words, preventing oxidation of the steel.

In the basic process manganese is the only economically available element for accomplishing this. The more powerful deoxidizers act quickly with both the metal and the slag and after their quick reaction is over, oxidation of the steel again proceeds. They should be reserved for what final deoxidation is still necessary.

Residual Manganese

The hour interval for effective deoxidation was determined by using the calculated 1 per cent manganese as an addition to the metal in the furnace at intervals of different duration before tapping. These intervals finally became extended to adding it with the charge. From these heats it was learned that the percentage of manganese which is maintained in the steel throughout the process is the important factor in securing uniform-

ly high quality, and that the time interval during which the manganese falls below a predetermined amount detracts from quality somewhat in proportion to the time, particularly if this interval is during the last hour of the heat.

If the percentage of manganese can be maintained at approximately 0.25, the quality, as it is affected by the reactions of the process, will be at its maximum. Percentages below this amount will give results less satisfactory but still worth while, down to perhaps 0.15 per cent. Below this results are obscured. Above 0.25 the benefit does not seem to warrant the expense. For most steels 0.20 per cent is a satisfactory amount consistent with the expense, reserving the higher figure for the more costly grades.

Preventing Oxidation

To secure and maintain a residual manganese approximating a determined amount requires different procedure depending upon the practice of the plant. A plant with run-off slags will differ from those without; duplex plants require a special procedure; the quantitative figures vary with the design of furnaces, depth of bath, fuel, bottom material, etc. In general, however, a normal basic open-hearth slag begins to be saturated with manganese when it contains 8 to 9 per cent MnO. A proportion of the man-

ganese in excess of the minimum requirement for the slag will remain in the steel, or, if introduced into the slag as the oxide, will be reduced from the slag and enter the steel. It makes no difference in the results obtained whether the manganese is introduced in the metallic form as ferro, spiegel, in the pig iron or scrap, or as the oxide from ore, or in any other available form, provided there is a sufficient amount to satisfy the slag for oxide and the metal for the percentage it is desired to have it maintain. The most economical form of manganese is the preferred one for adding it.

The slag volume is an important consideration. It is obvious that it must be the minimum consistent with the requirements of the other materials involved in the process. For economy of units of manganese, where run-off slags are used, the manganese should be added after the run-off and not with the scrap or not as a constituent of the hot-metal. The volume of slag after the run-off can be maintained extremely low.

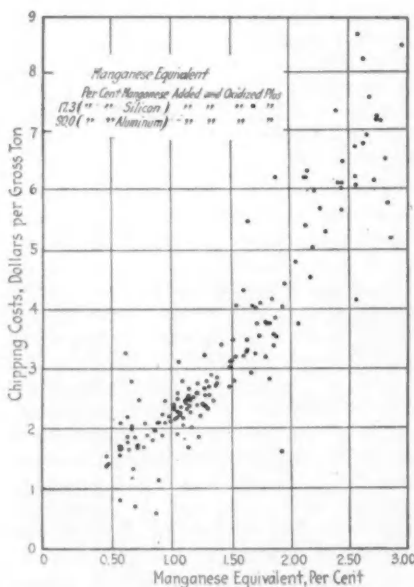
Slag which is saturated with manganese oxide is readily recognized by the brown color of the surface of a sample which has been in contact with the test-spoon, or the plate upon which it has been poured.

The Unknowns in Deoxidation

In this discussion theoretical explanations have intentionally been avoided. There is too little known about what happens in the process of so-called "deoxidation" to allow more than speculation. It is generally accepted that deoxidized steel is a superior product, but one could muster up sufficient evidence to prove that such is not the case, and also that it is.

If oxidized steel is steel containing iron oxide, either in solution or mechanically mixed, and deoxidized steel is that in which the iron oxide has been reduced by some element having a greater affinity for oxygen, the deoxidizing process is one of changing the nature of the oxide and not of reducing the percentage of oxygen content, unless the change is to a gaseous oxide which is insoluble in the steel. It would therefore follow that the desired end is to produce an oxide less injurious to the steel than iron oxide, or to provide in some way a sufficient interval for the newly formed oxides to float to the surface.

From the fact that steel deoxidized to a definite degree by the generally



Chipping costs of billets and manganese equivalent of deoxidizers used. 0.35-0.42 per cent carbon, nickel-chrome.

Steel Making Process

By LEWIS B. LINDEMUTH
Chrysler Building, New York



accepted procedure varies in rolling qualities in a ratio to the amount of deoxidation required, it could be inferred that this method produces neither oxides greatly less harmful than iron oxide, nor allows sufficient time interval for the oxides to float out. With better results beginning to be apparent after an hour's interval using the same material, it would seem either that the interval allowed a more complete change in the nature of the oxide, or allowed the necessary time for the newly formed oxide to float to the surface and be caught in the slag, or both.

On a large number of the heats shown on the chart analyses were made for oxides. While these analyses were probably not of a high degree of accuracy because of the facilities of the laboratory, they followed closely the trend of chipping costs. Also on these same heats observations of the rolling of the ingots were made through binoculars and an attempt was made to count the number of ingot cracks appearing during the first eight passes in the blooming mill. A curve of these also follows the chart.

Other considerations which discourage theoretical conclusions are the relationships of non-metallic impurities and grain size to rolling properties, and their relationship also to deoxidation. The products of oxidation and deoxidation are non-metallic. A general study of these is impossible under present steel works practice. With a 100-ton heat of steel more than 1000 lb. of brickwork is removed from the ladle lining, nozzle and stopper rod. While most of this undoubtedly is caused by the slag, yet some proportion of it may be found in the steel. Where inclusions of a size sufficiently large for an analysis can be collected, there is generally a content of alumina and silica in about the proportions found in the bricks of the ladle lining, regardless of whether the steel is basic or acid, or whether aluminum has been used as a deoxidizer or not. Where, as in the upper parts of the ingots, the inclusion is a complex silicate containing manganese, iron and aluminum, the ratio of alumina to silica is still materially that of the bricks. While the brickwork may or may not contribute much to the effect of non-metallics, it nevertheless obscures anything else that might, and leaves non-metallics in the realm of speculation.

Into that realm I wish to venture for a moment. In some heats of steel,

QUANTITY in steel, says the author, may be best obtained by reducing to a minimum the necessity for deoxidation. The assertion, however, is only incidental to an unusually penetrating discourse on the little known intricacies of deoxidation. Based on years of experience and remarkably complete records of thousands of heats, Mr. Lindemuth would have the industry achieve scientific reliance on making a precise product. He is an advocate of using an increasing ratio of scrap in the furnace charges, as discussed at length by him in *THE IRON AGE* of Aug. 4, 18 and 25, 1932, whereby greater economies, including a higher percentage of yield from the ingot, may be realized. The present article is concluded from page 541 of the issue of April 6.



perhaps all, in different degrees, the original grain structure of the ingot persists throughout all subsequent treatments. The more marked it is the more detrimental it is to the quality of the steel, particularly those properties related to ductility, hot and cold. "Rimmed" steel containing less than 0.05 per cent carbon and manganese, and to which only sufficient deoxidizers have been added to control the rimming, roll as near perfectly as any grade of steel. Had ingots of this steel been produced in type "C" ingots, those ingots would require a manganese equivalent of approximately 10.0 per cent, and they would be practically unrollable.

Rimmed steel is a comparatively highly oxidized steel. Its superior properties are not a matter of deoxidation. The essential difference is the fine grained "skin," with its lack of continuity of a growth of ingot structure. Steel made in an electric furnace with the reducing stage properly carried out, but poured at a higher temperature than would be employed for the same grade of steel when made in an open-hearth furnace, will be more completely deoxidized, but will have larger crystals and a more marked ingot structure, and will be of inferior quality to the open-hearth product.

If the grain structure which origi-

inated in the solidifying ingot can persist throughout all subsequent processing, and which adversely affects the properties of the finished articles, then there must be some physical difference in that boundary of the grains which allows them to maintain their identity, and which is greatly different from the material of the grain itself. Larger grains have this property of maintaining their identity more markedly than smaller ones, which would suggest that the material from which the boundary is composed is a product of the liquid steel, rejected from solution in solidification. The larger the grain the greater the thickness of the boundary material, and the poorer the product.

Could this isolation of individual grains be caused by non-metallics, by products of oxidation or deoxidation, or be influenced in composition by manganese or other elements so as to conform more nearly to the properties of the metal within the boundaries?

I believe that information on this subject would be far-reaching in its effect upon the quality of steel in ingots.

Full-Finished Sheets Now Made on Coast

Full-finished sheets, in 12 to 24 gage, are now being produced at the Torrance, Cal., plant of the Columbia Steel Co., Pacific Coast subsidiary of the United States Steel Corp'n.

The new facilities include a 148-ft. x 7½-ft. normalizing furnace, a box annealing furnace, a bar pickler, a break-down pickler, a sheet pickler, scrubbing and drying machines, cold rolls, roller levelers and oiling machines, a stretcher leveler and a laboratory.

An outlet for automobile body sheets will be found in a new Coast plant of a leading Detroit automobile manufacturer. Other grades of full-finished sheets, particularly furniture sheets, are widely used on the Coast. To accommodate the new facilities an additional building, 175 ft. long, and various smaller structures were added to the Torrance plant. The Torrance works, which is in the Los Angeles district, previously comprised four 50-ton open-hearth furnaces, a 36-in. blooming mill, a 22 and a 12-in. rolling mill, a 16-in. roughing mill, four commercial sheet mills, one jobbing sheet mill, and a steel foundry.

Birth Control for New Enterprises—a Remedy for Competitive Excesses

By C. G. THOMA

THE author believes that public interest is better served by protecting the investments and livelihoods of existing business organizations than by leaving the door wide open to newcomers. The right to start a new business is too frequently the right to overcrowd an already well-covered field and to make unbridled competition inevitable. He contends that birth control for new enterprises, under the direction of public authorities, is essential to protect the country from excessive capacity and business instability.

OPINIONS of industrial leaders expressed in the daily and business press lead one to surmise that, while they may still worship at the shrine of the sacred cow of "rugged individualism," they do so with steadily cooling religious fervor. Until the depression struck us the sanctity of this fetish of the pioneer days of American industry was regarded as about on a par with that of the Ten Commandments.

Strange how we blindly venerate or abhor a mere word or phrase, simply because tradition dogmatically prescribes our attitude toward it. Thus rugged individualism, denoting a certain freedom of conduct for the individual or company in its business relations, might not be questioned, under penalty of lese majesty. Thus, also, "dole" is used to describe—and damn—any measure proposed (by those who are not of the proper political gender) for the direct relief of the destitute individual by the Government. Of course, aid of this kind, if extended to a business enterprise and if it is large enough, is not called a dole. Under such circumstances it becomes "reconstruction"—or something.

Rugged Individualism Begets Unbridled Competition

Rugged individualism was a very desirable and proper doctrine in the early days when our infant industries needed every encouragement to insure their success and growth. With definite limitations it is still a most sound tenet. There is little doubt, however, that in its unmodified form it has become within late years one of the important causes of our more serious economic ills. "Unbridled competi-

tion" is one of its progeny and is responsible for much stupid, below-cost price-cutting, the wanton wrecking of established legitimate business enterprises, unemployment, and many other evils.

In one of the issues of THE IRON AGE a well-known business man ably described some of the faults of unbridled competition. He coined the word "deficiteer" to describe the individual or concern who, in a competitive market, sells below cost, either ignorantly or willfully. He would make it compulsory by law to obtain a profit from every transaction. That, of course, would mean an extension of the powers of the Government in business. It would entail the sacrifice of some of our cherished rugged individualism. Well, what of it? In view of the way some of our staunchest individualists have humbly begged the Government for emergency legislation of the most paternalistic kind to help us straighten out our industrial chaos, it behooves us to keep the soft pedal on this rugged individualism theme for a while.

Price Fixing Would Be Difficult

Most business men recognize that unbridled competition is not, at least, an unmixed blessing. The usual attitude is to condemn the methods of our competitors in getting the business we were after and blithely to overlook any little jabs below the belt we may administer to our unloved opponents. Even where minimum prices are fixed legitimately among competitors, as with the licensees manufacturing a patented commodity, there is always a temptation to "slip over a fast one" by "misinterpreting," "miscalculating," or "forgetting." So

far as any cooperative action among competitors to stabilize prices is concerned, even were it legal, this unfairness would militate against success. Unbridled competition can be regulated only by law. The matter of compelling a profit for every transaction, as proposed, is a good step. Another step would be to restrict, also by law, the number of new enterprises that may be founded to engage in a given industry, according to the requirement, actual and potential, of the market.

This last step would involve some sort of birth control measure for new business enterprises, under the direction of the governments, national, State and municipal, depending upon whether the activities of the proposed venture would be interstate, or confined within the boundaries of a State or a city. It should be applicable to every proposed new business from a large manufacturing plant to be capitalized for millions, down to the roadside hot-dog stand.

Industrial competition is a good thing and is necessary in the public interest. Like many other good things, however, it can be—and is—carried to undesirable extremes. In almost every established industry we have had within recent years vast over-production or, at least, over-capacity to produce. In many fields it would be possible for a fraction of the number of existing manufacturers to produce the requirements of the entire market. Yet, in most cases, there is nothing to prevent a man or a group of men from founding a new manufacturing enterprise in any of these already over-supplied industries, provided they can raise the capital. To prevent the birth of the new venture and the consequent further unsettling of a chaotic market would, of course, be a restriction of rugged individualism. The question seems to be whether unrestrained, rugged individualism or a greater measure of economic stability is the more valuable to the nation as a whole.

Public Interest Should Be Considered

We now have governmental control of competition in the case of public utilities. We do not permit the organization of a new gas company, for instance, to compete in territory already efficiently supplied by an existing manufacturer of gas. Why should we not extend some measure of similar protection to the manufacturers of commodities as well? And let's carry it right down to the corner druggist who faces the danger of seeing the legitimate business he has built up through a lifetime of service to the neighborhood wrecked by a newcomer who starts a drug store next door, not with the idea of rendering a better service to the community but merely of making a living for himself. The commission or board that would review the applications for the licensing or chartering of new

(Concluded on Advertising Page 18)

Re-screens Coke at the Blast Furnace Skips

By EDWARD J. TOURNIER

THE demand by blast furnaces for clean, graded coke has led to the development of methods of supplementary screening at the furnace. An installation of this kind has been made at the plant of the Weirton Steel Co., Weirton, W. Va.

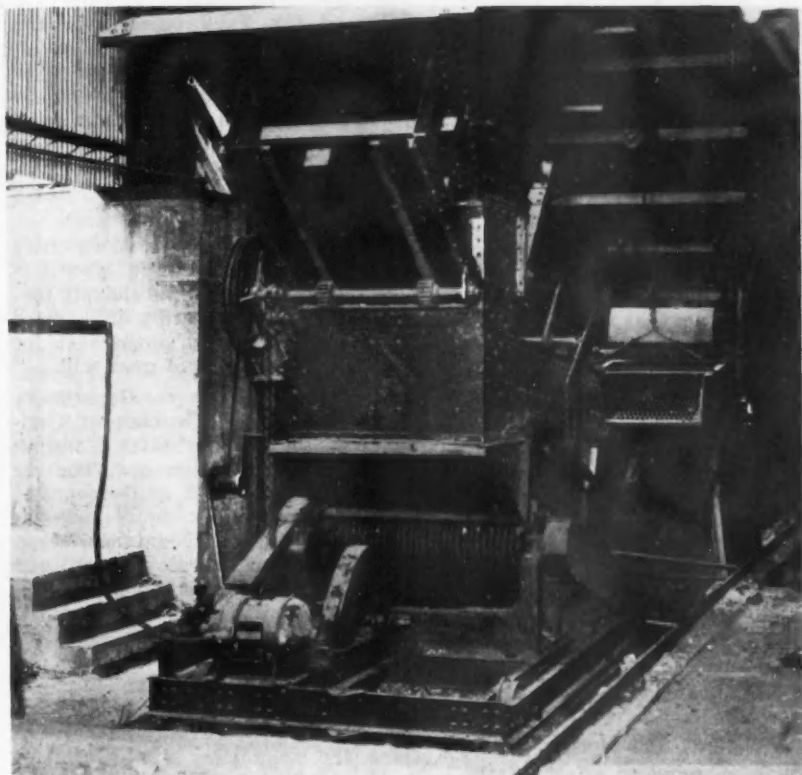
The system consists in collecting

thus avoid interruption of the furnace operation.

Coke passing through the grizzlies is discharged to a so-called breeze

skip-hoist. As the two grizzlies are a considerable distance apart, both cannot feed directly into the skip bucket. One of the screens makes a direct delivery, while the other delivers to the short cross-belt, which in turn discharges to the breeze hoist. This is an unbalanced bucket installation, having a 20 cu. ft. bucket on a lift of about 100 ft. The capacity is approximately 12 tons an hour, and is operated by a 15-hp. Westinghouse, two-speed motor. The motor is equipped with fully-automatic control and limit switches interlocked with the bucket loader so that the hoist motor starts only when the correct amount of coke is in the bucket. In this way a continuous cycle of operation is maintained without manual attendance.

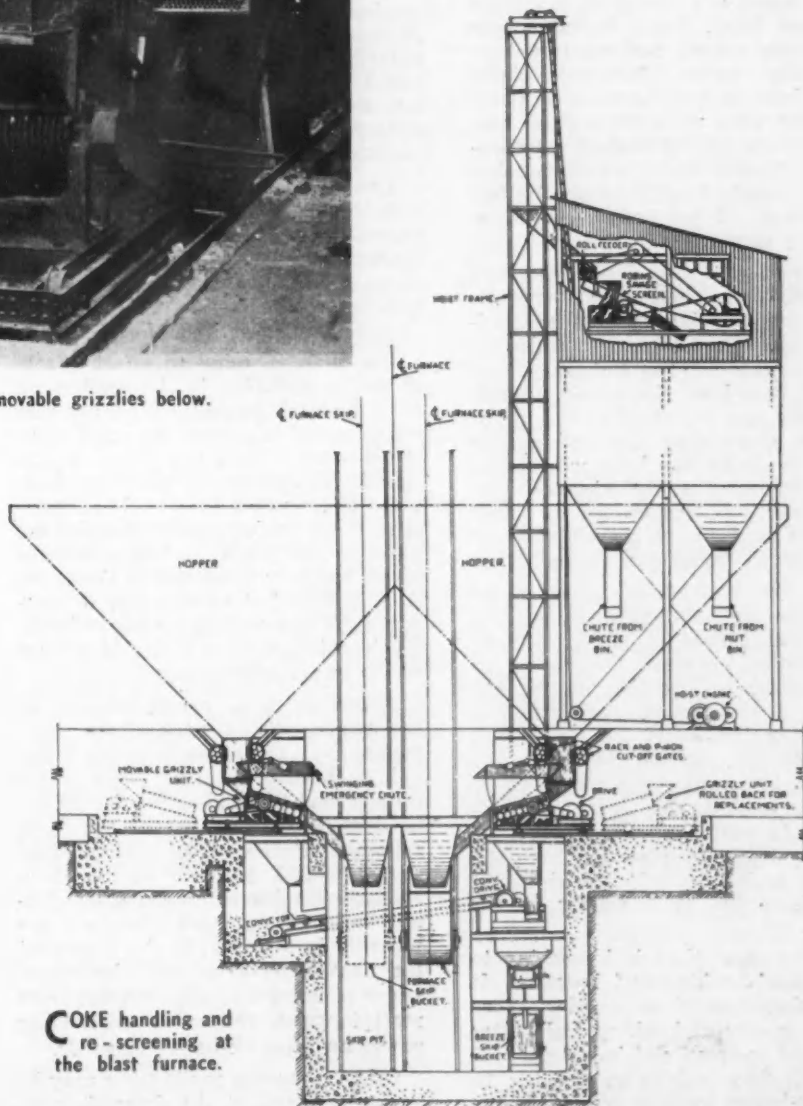
Coke is discharged from the skip-hoist into a feed-chute which regulates mechanically the amount of coke delivered to a shaking screen. This is a single deck unit producing



The coke-collecting hoppers, with movable grizzlies below.

coke in two large hoppers, screening out the furnace coke, and storing the breeze for other use. It is not essential to have two hoppers, but as in most cases there are two furnace skips the double hoppers allow a more efficient arrangement of machinery. Below the collecting hoppers, the equipment consists of two movable rotary grizzlies, one for each hopper, a short belt conveyor, and a single bucket skip-hoist. In addition there is a storage bin for breeze.

Each grizzly is an 8-shaft unit mounted on a wheeled carriage, which is movable on a track below the collecting hopper. Normally the coke passes over the grizzly, all pieces larger than 1½ in. being discharged through a chute to the furnace skip bucket. The chute is fastened to the foundation wall but is not connected to the grizzly, which permits movement of the latter for repairs. When this takes place, unscreened coke may be passed directly to the furnace skip by means of an emergency chute, and



COKE handling and re-screening at the blast furnace.

two sizes of material. The coke passing over the screen surface is $\frac{3}{4}$ in. or larger, while the product passing through the screen is breeze. Each size is stored in a separate compartment of the bin, which is fitted with chutes for loading trucks. The nut

coke is sold for domestic use, while the breeze serves as boiler house fuel.

As a result of this reclamation process, better furnace operation is possible, and in addition there is a substantial profit from the sale of coke.

Washington's Drive Against Unemployment Is Many-Sided

Administration's Program Not Universally Approved—Wisdom of Foreign Trade Policy Questioned

By L. W. MOFFETT

WASHINGTON, April 11.—Getting the unemployed back to work as quickly as possible is being given intensified attention by the Roosevelt Administration. With the number of idle now estimated at the staggering total of 13,000,000, and with many millions engaged only part time, the wage loss has been calculated at \$20,000,000,000 a year. Indirect losses are placed at a similar or larger total. These include losses in security values, real estate values, commodity values, dividends, bond losses, interest rate losses, etc. There are some who, without partisan bias of any sort, predict that if deflationary policies are continued, the number of idle by July 1 will be fully 20,000,000, almost 50 per cent of the total normally employed.

Governmental economy through trimming down unnecessary expenditures obviously is approved by business and the country generally. Slashes made by the Bureau of the Budget have been sharp and, though some are not universally held to be entirely warranted, the outstanding effect no doubt has been wholesome. Nevertheless, the deflationary tendency reflected has caused increased study to be given to the situation as it relates to currency and credit.

The Roosevelt Administration, in trying to get the employed back to work, has turned to many sorts of Government projects. Others are in contemplation. The Government has become a vast business and financial institution. It would like to unpack the load on private business and finance, but finds itself compelled to take the lead, so say Government officials. In past depressions it turned for help to the very sources which it is now trying to help or which, in some instances, it is calling on the carpet.

At the same time it is seeking to "regiment" banking and industry. It is driving toward a sounder, more unified system of banking and better organized railroad and industrial systems. It has legislation pending to set up a better banking system. It has

conferred with the oil industry, and is conferring with railroad executives. The desire is to get them all into a better state of organization, to get unemployed back to work, to restore purchasing power, and generally to start a momentum that would then let private business go on its own.

There are many who question the soundness of some of the Government projects, such as reforestation, the Muscle Shoals undertaking, etc.; yet objection is comparatively mild because of the hope that it will stimulate a movement toward business recovery, and because it does reduce unemployment.

The President is vigorously continuing his rapid-fire legislative moves to be fitted into a broad program to hasten prosperity. Though looked upon by many as experimental in some respects, they have elicited nation-wide interest and hope.

One plan in mind to offset effects of undue deflation is the setting up of a Federal liquidation corporation which would take over the good, more liquid assets of banks that remain closed. Consideration also has been given to proposals for a Federal mortgage relief project, perhaps along the lines of the farm mortgage scheme which has been presented to Congress. A \$2,000,000,000 corporation to support a 100 per cent guarantee of banking deposits has been proposed as part of the banking program.

Assuming farm prices increase as the result of the agricultural commodity bill, the desired rising trend will be widespread; yet other measures beyond those already enacted are held to be required to further force reflation. Public works, estimated at \$3,000,000,000, probably to include a \$230,000,000 Naval program, the former to call for a bond issue, are apparently in prospect, in the hope that the decline in prices will be halted and a movement upward started from reemployment, return of purchasing power and free exchange of goods.

Other measures conceivably may be begun as part of the domestic pro-

gram. Tied in with the plan of recovery is the proposed world economic conference, the preliminaries of which will begin in Washington this month. Then too the Administration is planning, it is said, to negotiate reciprocal tariffs, nation by nation—and it is reported this program is about to be submitted to Congress. And a "gesture" toward worldwide reducing of tariffs is said to be under consideration by a 10 per cent cut in the American tariff.

The so-called world economic conference has not attracted American public attention to a great degree. The American public perhaps has gathered the fixed opinion that in treating with other powers as to debts, disarmament, or whatever it may be, the United States is always asked to give until it more than hurts and gets nothing in return. The cost of getting out of the miscalled isolationist class has been extremely heavy for the American republic.

Certain it is, too, that with industry barely moving, struggling with foreign competition, with its cheaply produced goods, it is hardly in a mood to see the tariff taken down, even for the sake of a gesture of good will.

The Foreign Commerce Department Committee of the Chamber of Commerce of the United States is urging adoption of legislation granting the treaty-making branch of Government authority to initiate tariff negotiations with foreign countries "when clearly in the national interest" and retention of the present policy of unconditional most-favored-nation treatment. It is the general view that Congress will not give serious consideration to the idea of yielding such power to the executive branch. In advocating authority for bargaining negotiations, the committee, of which James A. Farrell is chairman, stipulates that there should be no exercise of such authority until American industries are protected against depreciated currency competition or until there is a substantial return to the gold standard.

So far as known, the Roosevelt program does not propose to do anything to offset the effect of depreciated foreign currency on imports, rather it promises to increase the advantage of depreciated currency nations in shipping to the United States by further lowering the American tariff. That, however, of course, will require Congressional approval. The Roosevelt Administration would like to see the gold standard restored to countries that have abandoned it and is probably making moves toward that end. But realization of this hope plainly is not in sight.

The Chamber committee strongly supports the existing policy of unconditional most-favored-nation treatment, urges that the British Empire preferences be not recognized as an admissible exception to such treatment, and attacks the Ottawa agreement as being economically unsound.

Economic Justification of the Small Machine or Tool Shop

By FRED J. SCHLEGEL

Pottstown, Pa.

THE number of manufacturing plants in the United States listed by the Department of Commerce is over 200,000. Most of these plants use machinery in the production of their products or in the services they render. Of this number about 20,000 are listed as machine shops. The figures available also show that in 1929 the value of the products produced by the machine shop industries was over 14 billion dollars. Normally, the annual purchases of machinery totaled between five and six billion dollars, but they declined to approximately one billion dollars in 1932.

The latest Department of Commerce figures also show that there are over 14 million gainfully employed in the manufacturing mechanical industries. Since 95 per cent of the manufacturing plants of the country have not more than 200 employees, a great number must necessarily work in small plants. The small machine or tool shop is one of the vital parts of the whole manufacturing industrial field and must therefore be economically justifiable.

Serves Special Needs of Large Plants

The necessity for the larger manufacturing plants to have certain work done outside their plants because of lack of equipment or experience also justifies the existence of the small shop. During good business periods the larger manufacturing plant must concentrate its efforts on getting out its production. Any extra work, such as building special machinery, equipment or new tools, would seriously interfere with its production schedule. Again the class of workmanship ordinarily prevailing in the large plant may be too high or too low to economically produce the required machine work. The particular type of shop that can manufacture the desired work can be called in to produce it at a predetermined cost.

Small Orders Handled Promptly

The small shops can profitably handle small orders because they do not need the system that is necessary to manage a large plant. These shops can and do take the overloads of other manufacturing establishments. Because of the small machine shop owner's varied experience with different kinds and classes of work for the different industries requiring machinery to manufacture their products, he can

bring to bear on any one problem a vast fund of practical mechanical information that is of material benefit to the buyer of his services.

Close Work Supervision Possible

Practically every shop of the machine or tool shop designation has at its head an expert mechanic or designer who, because of his ability and experience, is in close contact with the work as it progresses and can

THE small machine or tool shop justifies its importance in our industrial structure, according to the author, whose paper has been awarded a certificate of merit by the American Machinery and Tools Institute. Summarizing the important phases of the subject, Mr. Schlegel stresses particularly the relationship of the small shop to the large manufacturer.

order any apparent improvements to be made as they are determined. The jobs in process are usually small in number and therefore all can be kept in mind. This assumption on the part of the shop head of multiple duties keeps down the cost of supervision or overhead. In the large plant the responsibility of supervision must be allotted to a number of men, due to the inability of anyone to do more than a certain amount of work in a fixed time. This distribution of supervision necessitates consultations when changes in design or method are recommended, causing a loss of time and an added expense.

Specialization Provides Economical Service

Some shops are especially good on close, fine work, others on work of a medium grade, and others on heavy machine work. To combine all these grades of work in one plant has not been found as economical as when

each grade of work is done by a specialty organization. When the shop owner has acquired enough business to specialize in some particular class of work, his fund of information makes him a better specialist than had he started out in a specialty line. He has gradually built or bought special machines and tools and other equipment to render this special service economically.

The designer or man who has ideas to develop must of necessity go to the small shop. The large shop is not organized for and will not bother with this kind of work. In the small shop he comes in contact with the shop head and often the men actually working on his job. This keeps down his costs until his ideas are proved and marketable. The cost of developing would otherwise often retard and sometimes eliminate the placing of articles on the market. In working out ideas, the mechanics doing the work oftentimes can suggest improvements, either in the final product or in the method of production, that will make the product more desirable or less costly to manufacture.

Cooperative Spirit of Personnel

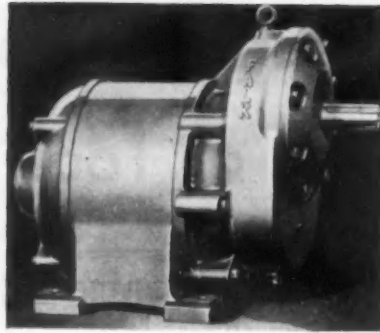
In the small shop the mechanics feel more of a personal interest in a job because they are in close contact with the shop head or designer and will not hesitate to advance suggestions which they feel will improve the final product, since their ideas usually can be taken up directly with him or them. This is practically impossible in a large plant because of the systems in operation in the vast majority of large establishments.

In conclusion, the great number and variety of manufacturing plants requiring machinery for their operation necessarily require a variety of types of machine shop organizations for servicing and tooling-up these plants. The small machine shops take the overloads of other organizations and render special service, such as building special machinery, tools or making repairs. The multiple duties of the shop owner enable him to expedite the work, keep down the cost of supervision and other overhead expense, obtain greater cooperation between the buyer and the shop organization in the development of changes, and bring to the job the varied experience of many kinds of jobs and the ability to make a profit out of small orders.

Geared-Head Motoreducer for Low Ratios

THE geared-head Motoreducer recently added to the line of the Falk Corp., Milwaukee, is a combination motor and gear unit, designed especially for relatively low ratios, both speed reduction and speed increase. It makes possible the use of high-speed motors, which are relatively less expensive, and provides any desired speed from one-ninth motor speed to about two and one-half times motor speed. This speed variation is secured with a simple single-pair gear train, a construction emphasized as giving the utmost in simplicity, rigidity and compactness.

The geared-head unit differs from the other three types of Falk Motoreducers (integral, flexible, and all-motor) in that the motor frame supports the gearing, the gear housing being rigidly connected to and supported from the stator. This is possible



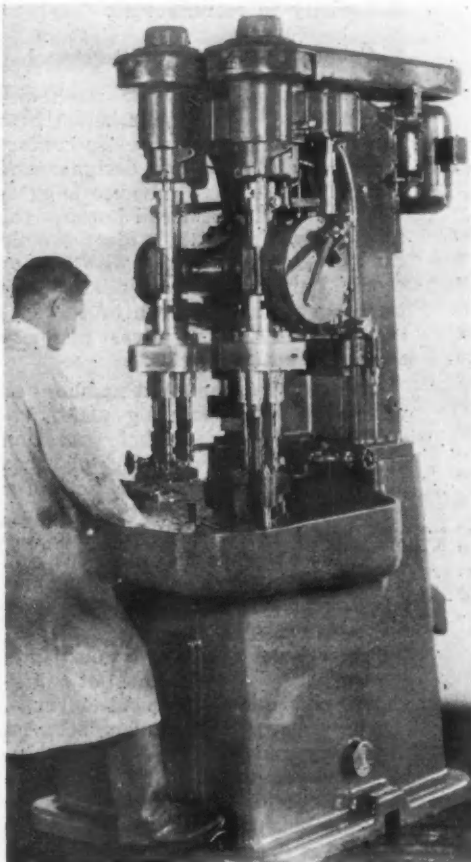
because of the relatively low torque multiplication in these low ratios, which the motor frame is amply strong to carry. A standard ball bearing motor is employed, and gearing is of precision helical type. Quiet running and high efficiency are claimed.

Multiple-Head Cam-Feed Drilling Machine

A TWO-SPINDLE ball-bearing drilling machine with V-belt vertical motor drive, connected cam feeds, and multiple-spindle drill heads mounted on flanged quills has been built recently by the Chas. G. Allen Co., Barre, Mass. Either cabinet base, as shown, or adjustable table can be furnished.

This machine, designated as the

No. 3, is suitable for drilling and reaming, drilling and countersinking, or drilling and tapping. Each drill head is controlled by its own cam, which can be designed to produce any combination of quick advance, feed and dwell, or any desired lead for tapping, independent of the drilling feed. The camshaft stops automatically at the end of each cycle. The



Individual V-belt motor drive to the spindles and a reversing motor for the left-hand spindle are features of the improved Allen drill at left

In pointing rods preparatory to drawing, the swager at right produces at the rate of about 400 ends an hour



locking pin in the circular table is withdrawn by the foot treadle, and the camshaft starts instantly when the locking pin snaps into place at the completion of the index. This permits the operator to concentrate on loading and indexing without danger of being caught by premature engagement of the feed.

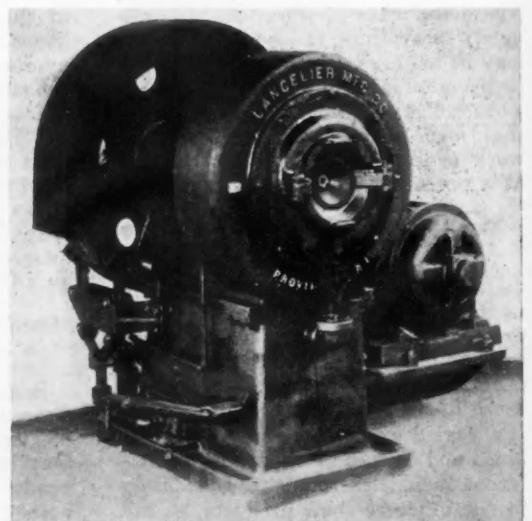
Loading four pieces at a time, 1200 pieces can be drilled and tapped per hour, the piece being of mild steel 1/2-in. thick and a 7/16 in.-20 tap employed.

The particular machine illustrated has a three-station semi-automatic index table arranged to drill and tap simultaneously. The separate feed cams may be seen plainly.

Swaging Machine For Pointing Rods

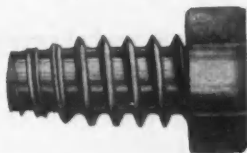
COPPER and nickel silver rods are pointed rapidly by the swaging machine illustrated, which was built recently by the Langelier Mfg. Co., Providence, R. I. The pointing is done preparatory to drawing, so that the stock may be threaded through the die for gripping by the jaws. The three sets of dies furnished with the machine reduce 3/4-in., 11/16-in. and 5/8-in. stock about 0.150 in. per pass for a length of 12 in. Production averages about 400 ends per hour.

The machine is equipped with Timken bearings and has a pressure feed system for lubricating the operating parts in the head. As a wide range of sizes will be handled, the cover for the dies is made for quick removal. A flywheel brake is furnished to stop the rotation of the spindle immediately to keep to a minimum the time required for changing tools. The drive is by a 15-hp. motor, through V-belts. The machine requires floor space of 52 x 60 in., is 56 in. high, and weighs approximately 5 tons.



Self-Tapping Hex-Head Cap Screws

HARDENED self-tapping hex-head cap screws have been added to the line of fastening devices made by the Parker-Kalon Corp., 200 Varick Street, New York. Like the company's other types of self-tapping screws, these screws cut their own thread as they are turned into drilled or punched holes in the material. They are made in sizes ranging from No. 6 to 1/2 in., for use on sheet metal from No. 24 gage (0.025 in.) to No. 10 gage



(0.140 in.) and on steel plate and structural shapes up to 1/2-in. thick. They are suitable also for fastening solid sections of brass, bronze, aluminum, die castings, slate and other materials.

Machined and Centered Bronze Bearing Metal

ELMINATION of a large part of the labor and expense of machining bushings, bearings and bronze parts from bar stock is claimed for the new line of cored and solid bars of phosphor bronze bearing metal recently brought out by the Bunting Brass & Bronze Co., Toledo, Ohio. These bars are machined and centered, and are supplied in 13-in. lengths instead of the conventional 12-in. lengths. They are available in a wide variety of stock sizes.

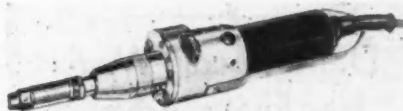
Advantages include the absence of hard surface scale, and of under-surface casting defects, such as blowholes or sand inclusions, material having casting defects being scrapped by inspectors at the time the bars are machined at the Bunting plant. The new bars are round and straight and as they are turned on centers, the out-

side diameter is concentric with the bore. There is sufficient stock on the outside diameter to allow a finished bushing to be machined to the size labeled on the bar. Cored bars are rough cast on the inside diameter to the size stamped on the bar and the user should allow approximately 1/8 in. finishing stock on this dimension.

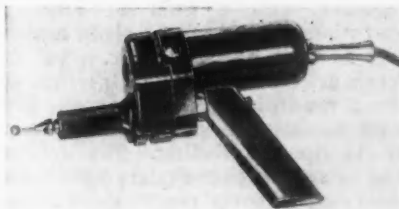
The ends of both cored and solid bars are machined, thus exposing the material underlying the cast surface; this eliminates surface scale and assures a wall free from defects. The centered ends facilitate set-up by machinists and save tooling time. Turning of the bars on centers eliminates extreme variations in wall thickness and loss of material in machining. The 13-in. length of bars permits the machinist to obtain multiples of standard bushing lengths.

Compact Portable Electric Tools

THE automatic electric screw driver and nut setter and the high-speed electric die grinder illustrated have been brought out by the United American Bosch Corp., Springfield, Mass., and are forerunners of a full line of precision electrical tools designed, it is stated, to reduce production costs by lowering down time and power consumption and by eliminating spoilage.



The screw driver (above) is 2 in. in diameter and weighs but 3 3/4 lb. The high-speed grinder (below) is for finishing patterns and dies



Features of the automatic screw driver include compactness, the tool being only 2 in. in outside diameter and weighing but 3 3/4 lb. An automatic pressure clutch, adjusted through a graduated scale, is provided. The tool is equipped with a fan-cooled universal motor and is Resistex insulated throughout. A special stationary centering sleeve with self-centering bit provides accurate adjustment for all types of screws and nuts, preventing damage to heads.

The electric die grinder, also of compact construction, is suitable for finishing patterns and dies. It has a spindle speed of 50,000 r.p.m. and employs wheels ranging from 5/64 to 5/8 in. in diameter. It is said to be possible to grind with close accuracy extremely small radii and to reach in-



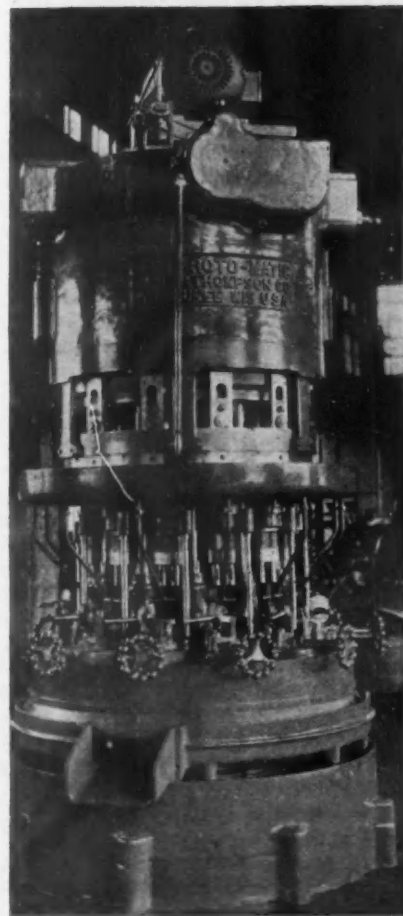
Continuous type machine for drilling, straddle milling and taper reaming steering arms

accessible places. The tool has a Resistex housing and is provided with a pistol grip, as shown.

High-Production Drilling and Milling Machine

A STANDARD 12-spindle Roto-Matic continuous-type vertical drilling machine equipped with 12 two-spindle drill heads and 12 milling spindles for straddle-mills has been furnished recently by the Davis & Thompson Co., Milwaukee, for operations on automobile steering arms. The machine is furnished with 12 fixtures arranged to grip the arm at the boss. The fixtures oscillate, the movement being by cams beneath the table.

After the fixture is oscillated to correct position for loading, the piece is placed in the fixture and clamped by the turn of a handwheel. As the machine turns around, the fixture carries the boss of the steering arm between the straddle-milling cutters. When the milling operation has been completed the piece is carried under a drill, where it is held while being drilled; from this position it is carried under the reaming spindle where it is taper reamed. The piece is then brought to the loading station where it is removed from the fixture and replaced by another. Production is said to be approximately 600 pieces an hour. The machine is of flexible design and has wide range.



Pacific Coast Steel Prices Affected by Foreign Competition

SAN FRANCISCO, April 8.—A compilation of iron and steel imports at Pacific Coast ports for the past three years shows a decline from 122,391 tons in 1930 to 48,873 tons in 1932, but this decrease, it is stated by domestic steel producers, has been due to business conditions rather than protective measures.

Commenting on the effect foreign steel has had on steel prices, a Pacific Coast steel executive says that foreign steel has been one of the major factors in the price decline. He points out that foreign steel is being laid down at Pacific Coast ports at prices below the actual costs at Pacific Coast mills.

The following table gives total imports of various iron and steel products for the years 1930, 1931 and 1932:

	1930	1931	1932
*Pig iron.....	12,936	9,844	4,182
Reinforcement bars..	6,764	16,691	6,046
Merchant steel bars	13,459	14,588	10,765
Sheets	19,666	12,172	5,774
Plates	726	203	315
Shapes	34,412	13,104	4,716
Pipe, wrought steel..	13,588	8,534	3,459
Pipe, cast iron.....	8,797	3,652	256
Barbed wire.....	2,114	2,765	3,511
Wire rope.....	773	459	502
Galv. and plain wire.	1,871	1,038	551
Hoops and bands...	3,034	3,712	3,115
Nails	4,251	6,356	5,681
Totals	122,391	93,118	48,873

*Shown in tons of 2240 lb.

Inland Steel Co. Buys A Steckel Mill

Inland Steel Co., Chicago, has been licensed by Cold Metal Process Co., Youngstown, to operate under Steckel patents, and has placed an order for a wide Steckel cold mill to be used in strip department. Cold Metal company has also completed a 20-in. Steckel cold mill for the Universal Steel Co., Bridgeville, Pa., which will be used for rolling of corrosion-resisting, special alloy and high-carbon strip steel.

The Cold Metal Process Co. has completed arrangements with the Krupp interests of Essen, Germany, whereby the latter will assume exclusive European manufacturing rights on Steckel hot and cold strip mills. Engineers of the Krupp organization spent considerable time in the United States last summer investigating the possibilities of the Steckel mills, and the company will send two additional representatives to this country in the near future to gain further acquaintance with the process.

Ohio Freight Surcharges May Not Be Restored

The emergency surcharges in Ohio freight rates on iron and steel products for intra-state shipments, which were placed in effect early in 1932, expired April 1, and several railroads have prepared new tariffs for intra-state shipments to become effective May 1 in order to restore these surcharges which are the same as are allowed by the Interstate Commerce Commission on inter-state shipments.

However, the restoration of these surcharges on intra-state traffic is regarded as improbable because of the attitude of the Ohio Public Utilities Commission, which must approve the

proposed new tariffs before they become effective. The surcharges are 2c. per 100 lb. on steel products and 12c. a ton on pig iron.

Unfilled Steel Orders Decline 13,198 Tons

Unfilled orders of the United States Steel Corp. declined 13,198 tons in March. The total on March 31 was 1,841,002 tons, a new low record. The March decrease is the fifth in succession. Unfilled orders at the end of each month since 1930 follow:

	1933 Tons	1932 Tons	1931 Tons
January	1,898,644	2,648,150	4,132,351
February	1,854,200	2,545,629	3,965,194
March	1,841,002	2,472,413	3,995,330
April	.....	2,326,926	3,897,729
May	.....	2,177,162	3,620,452
June	.....	2,034,768	3,479,323
July	.....	1,966,302	3,407,816
August	.....	1,969,595	3,169,457
September	.....	1,985,090	3,144,833
October	.....	1,997,040	3,119,432
November	.....	1,968,301	2,933,891
December	.....	1,968,140	2,735,353

Receives Contract for New Strip Shear

Development of a new high-speed precision flying shear for light gage cold strip by the United Engineering & Foundry Co., Pittsburgh, has been followed by a contract for the installation of the machine in one of the largest tin plate mills in the country. The new unit was viewed recently at the Pittsburgh plant of United company, by representatives of a number of tin plate manufacturers.

The machine is designed to shear strip up to 36 in. wide, from 0.006 in. to 0.025 in. thick into any selected length from 12 in. to 26 in. in increments of 1/64 in., and from 26 in. to 52 in. in increments of 1/32 in. The action is continuous and fully automatic. It operates at a maximum

speed of 300 ft. per min., a much higher rate than usual for flying shears designed for this type of material.

The importance of obtaining each length exactly as desired without error has necessitated the designing of a gear box having a total of 832 changes of speed. These speed changes are obtained quickly through three levers located on one side of the gear box. It takes approximately 80 sec. to effect the gear change and not over 20 sec. to change the guides. An ingenious device is applied to the knife operating levers for changing the setting of the knives while operating.

Mercer Tube & Mfg. Co. In Receivership

D. M. Naismith and D. V. Sawhill were appointed receivers for the Mercer Tube & Mfg. Co., Sharon, Pa., and its two subsidiaries, the Sharon Steel Products Co. and McDowell & Co., in Federal Court at Pittsburgh on April 8. Receivership was sought by Republic Steel Corp., Youngstown, and Sharon Steel Hoop Co., Sharon, Pa., which had claims against the company of \$37,082 and \$3,741, respectively. It was contended that continued operation might cause assets of the Mercer company to be dissipated. The company began the manufacture of butt-weld pipe early in January, and operated only a short time.

First Post Office Awarded By New Administration

WASHINGTON, April 11.—The general contract for the St. Paul Post Office, requiring about 1800 tons of structural steel, has been awarded to the Fleisher Engineering & Construction Co., Chicago. This is the only post office job released since the advent of the Roosevelt Administration. Other jobs are being held up, though some are expected to be released later. The holding up of awards apparently is due to the reforestation act, permitting use of unexpended balances under this law for reforestation.

Detroit Scrap Market Has Sharp Advance

DETROIT, April 11.—An increase in district steel operations the past week and a promise of further expansion during the remainder of this month, together with a gain in foundry operations, have brought about a general advance of 25c. to 50c. a ton in scrap prices, including an increase of 50c. a ton in heavy melting steel. The most sensational spurt was \$1 a ton in old No. 2 busheling. The upturn was so sudden that dealers have been scurrying to cover recent short sales.

OFF THE ASSEMBLY LINE



Sharp Upturn In Motor Car Production Brings Increased Orders for Steel

DETROIT, April 10.

THE automotive industry, as well as the steel trade, has been surprised at the rapidity with which motor car production expanded the past week and at the amazingly good showing made in retail sales during March. It is no exaggeration to say that sentiment in Detroit has suddenly risen to the highest point in more than a year. Automobile companies had expected a revival of retail demand as soon as banking difficulties began to clear up, but they scarcely were prepared for the quick public response which actually developed. Many manufacturers have boosted schedules for April far above the total which they had anticipated only a few weeks ago.

Chevrolet is an outstanding example of the quick transformation from inactivity to intense factory operations. In the second week of March its plants worked only one day, shutting down on Monday night until the following Monday morning. It opened its manufacturing and assembly departments on March 20 on a greatly restricted basis, uncertain from day to day as to its operations. Yet retail sales turned upward so sharply that Chevrolet has increased its April schedule from 35,000 cars, an estimate arrived at about two weeks ago, to a minimum of 55,000 cars, with a strong likelihood that the final figure will be 60,000. Factory operations have risen from three days a week to four and now to a full five days. It is anticipated that all departments will run five days a week during April and May, although naturally this plan is subject to change according to the trend of retail buying. The goal tentatively set for May is 60,000 cars. It would not be surprising, however, if assemblies went as high as 65,000 units.

Retail Sales a Surprise

Despite the banking hurdles put in its way, Chevrolet made retail sales in March of 34,716 units, compared with 33,125 in the same month of 1932. In the last 10 days of the

month, deliveries were 5000 units ahead of the corresponding period of last year. Even in Michigan, which was practically without banking facilities during the entire month, a gain of 200 cars over March, 1932, was recorded. Retail deliveries in the first quarter of the year amounted to 106,691 units, as against 100,273 in the same quarter a year ago. At the end of March Chevrolet's 10,000 dealers had in their possession 42,700 new cars and trucks, a drop of 2000 in 30 days. Normally there would have been a considerable increase in stocks.

Chevrolet turned out 38,665 cars in March, compared with 38,890 in the same month last year, a remarkable accomplishment in view of the banking paralysis during the month. Of that number, 10,743 were of the standard line, recently introduced, and 27,922 were of the master series. During the entire first quarter Chevrolet built 148,336 cars and trucks, or 14,973 more than in the first quarter of 1932. Chevrolet's steel releases the past week were fairly heavy and covered the remainder of its requirements for April. Within a week to 10 days Chevrolet will purchase its steel for May. Thus the steel mills supplying Chevrolet are looking forward to sizeable tonnages. Fisher Body Corp. is expected to buy sheets and strip steel today or tomorrow for its Cleveland plant which makes Chevrolet bodies.

Ford Production Expanded

Ford, like Chevrolet, has expanded its production for April from 40,000 units to 42,000 and then to 48,000. Rouge is turning out about 2000 units a day, and for the first time in almost a year the motor assembly department operated on Saturday last week, making a full six days' operation for the week. Steel releases have been given from day to day, and the local mill and Cleveland mills in particular have benefited from this tonnage. Ford is running some of its steel finishing mills on an irregular schedule as the need for material arises.

However, its blast furnaces and open-hearth furnaces are still idle, with apparently no plans for opening. Semi-finished steel stocks at Rouge are being gradually reduced, some of this material having been rolled by the local steel mill.

Ford's program for the small V-eight car (model 44) is being held in abeyance. Some machine tool companies are finishing equipment for tooling up on this job, but others still have hold-ups. Apparently no date has been set for the introduction of this model. For the moment all efforts are being concentrated on the present large V-eight. Ford will be an increasingly important factor in the steel market as the month progresses. Some of Ford's parts suppliers have speeded up work. One large malleable foundry poured six days last week.

The Chrysler Corp. is reported to have a schedule for April and May totaling 62,000 units, of which 30,000 will be turned out this month and 32,000 in May. The Plymouth division will assemble 18,000 to 20,000 cars in April, with Dodge, De Soto and Chrysler building the remaining 10,000 to 12,000 units. Plymouth next Saturday will present a new 112-in. wheelbase car to be known as the De Luxe Plymouth Six. It will supplement the present line of 108-in. wheelbase cars and will have a price range running up to \$30 above the latter. It will have the all-silent transmission now standard equipment on the Dodge, De Soto and Chrysler cars. It also will have a redesigned radiator shell and new general front end appearance.

With the introduction of the new car, Plymouth, like Chevrolet, will have two distinct lines of cars. The new car has been in production for several weeks. Plymouth's assemblies are about 1200 to 1300 cars a day.

Pontiac Production Stepped Up

Pontiac has jumped its April production from 5000 to 8000 cars. In March it delivered to customers 5207 units. Oldsmobile has increased its

assemblies for this month, but Buick is lagging at 2500 cars. Cadillac will make 1100 cars in April. Hudson tripled its schedule for this week and in doing so had a mad scramble to get steel. Its assemblies for the week will be 800 to 900 cars. It estimates its factory shipments of cars for April at 60 per cent above those in March and 40 per cent above those in April, 1932. For the week ended April 1, De Soto made retail deliveries of 1296 cars. Dodge deliveries in the same week were the highest since July, 1931. March retail sales of Dodge cars totaled 3724 units, compared with 3014 in February, 2925 in January and 2467 in December. The Dodge truck plant is operating six full days a week, with sales running 700 units ahead of production. Buick sold 3111 cars in March. In the last ten days of March Studebaker made 1758 retail deliveries of Studebaker and Rockne cars, the best showing since last June. Incidentally, all Rockne production has been moved from Detroit to the Studebaker plant at South Bend. Heretofore the Rockne motor was made at South Bend, but cars were assembled at the local plant.

Great Lakes at 84 Per Cent

Because of the sharp upturn in steel releases, Great Lakes Steel Corp. added two open-hearth furnaces to its active list the past week and is now running at 84 per cent of ingot capacity. It is understood that within a very short time it will have all six of its furnaces in operation.

Automobile production this month is now estimated at a minimum of 150,000 units. It is believed that the year's peak will be reached in May or June. This will repeat last year's performance when these two months vied with each other for the year's honors, the final figures showing that May exceeded June by 2301 units. It is fair to assume, under the circumstances, that the steel trade will enjoy a fairly well sustained demand from the automobile industry for the next 30 to 60 days.

In the first quarter, General Motors delivered to consumers 140,369 units, compared with 143,514 in the same quarter of last year. Domestic production totaled 167,584 units against 166,304 in 1932. Chevrolet's assemblies in the first three months of this year accounted for 88 per cent of the General Motors total.

Department of Public Property, Springfield, Ill., Willis J. Spaulding, commissioner, asks bids until April 17 for one power traveling crane, 60-ton capacity, about 47-ft. span; one 10-ton and one 5-ton hand-operated cranes, about 37½-ft. spans. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., consulting engineer.

... LETTERS TO THE EDITOR ...

Rustless Iron Corpn.'s Position in Patent Suit

Editor of The Iron Age:

In your issue of March 30, a news item appeared under the heading, "Appeal Filed in Suit Over Stainless Steel Patents," reference being to the suit filed by American Stainless Steel Co. and Electro Metallurgical Co. against Rustless Iron Corpn. of America for infringements of patents known as the Clement and Hamilton and Evans patents. I am reluctant to engage in what may seem controversial matter, but the wide circulation of this article makes it necessary to resort to this means of presenting the facts and I hope that you will find it possible to give this letter equal prominence with the article referred to.

It is unfortunate that excerpts of the decision have been quoted without reference to the remainder of the decision. The inference is advanced in the statement that the Clement patent was declared invalid because of the Haynes patent, also owned by American Stainless Steel Co. The court found as follows:

....., because we find that defendant has sustained the burden, which rests upon it, of proving that the Clement patent has been anticipated by the Haynes patent, and by prior public use, and is therefore invalid.

As a matter of fact the weight of the evidence introduced bore on prior public use rather than on prior patents. The court further states:

At this point it may be asked whether, upon the view just taken of the prior uses of the lead-in wire and the turbine blades with respect to Clement, these prior uses would not also have invalidated the Haynes patent, because the use of the lead-in wire at least, if not also of the turbine blades, appears to have antedated the Haynes application. Suffice it to say that in reply, presumably, if in the Ludlum company case, *supra*, Haynes had claimed the alloy as Clement did, and if one or both of these prior uses had been made a matter of evidence in that suit, the Haynes patent might have been held invalid.

American Stainless Steel Co. brought suit against us on the Haynes patent as well as on the Clement and Hamilton and Evans patents. By depositions taken before trial evidence was disclosed of the prior uses referred to by the court in his comments above. Following the taking of this testimony the Haynes suit was dismissed by the court on motion of the plaintiff. The evidence so introduced in the Haynes suit was perpetuated by the court and may be used in any subsequent suit under that patent.

Certain comments of the court made *obiter dicta* on the similarity of the Wild process as practiced by us to the Hamilton Evans process are emphasized in the statement, but as a matter of fact those remarks have no bearing whatever upon the validity of the Wild patent. It should be distinctly understood that the validity of the Wild process patent 1,586,591 owned by us was not involved in any way in the above suit and for that reason the defense of the suit as to the Hamilton and Evans process patent was directed chiefly toward proof of the latter patent's invalidity, there being no occasion to emphasize the novel features involved in the Wild process which distinguished it from the prior art and consequently the Hamilton and Evans process.

The Wild patent follows the prior art as far as the prior art goes, just as does the Hamilton and Evans process in suit, but it was not considered necessary in the argument to direct attention to those claims of the Wild process patent which extend beyond the prior art and the Hamilton and Evans process and which claims are sufficiently novel and unique that patents were granted not alone in the United States and Canada, but in 31 foreign countries. The novelty of the Wild process is of great importance metallurgically as well as from the standpoint of commercial manufacture and is fully protected by the claims of the patent.

Again in General Conclusions, the court states:

For the reasons given, we find that as to all of the claims here in suit, namely, claims 10 and 11 of the Clement, and claim 1 of the Hamilton and Evans patent, defendant has sustained the burden of proving that they are invalid, and that therefore the plaintiffs are not entitled to any part of the relief sought by their bill of complaint, but that on the contrary, the bill must be dismissed. An order will be signed in accordance with this opinion.

It is our belief, as a result of the evidence developed in the preparation of these suits and as a result of this decision, that the position taken by our company on the manufacture and sale of Rustless material has been completely justified.

C. E. Tuttle,

President, Rustless Iron Corpn. of America
72 Wall Street, New York.

Editor's Note: We are publishing the above letter not with any idea of prolonging discussion on a moot question between private parties, but to give the author an opportunity to answer a statement quoted in THE IRON AGE of March 30. Obviously patent controversies cannot be settled in the pages of a business publication. Moreover, a business paper cannot assume responsibility for statements quoted from parties to such a dispute.

Railroad Reorganization Would Effect Big Savings, Says Loree

Delaware & Hudson President Estimates That \$1,462,600,000 of Expense Could Be Wiped Out

WASHINGTON, April 11.—Railroads of the country could save at least \$50,000,000 a year by substituting improved up-to-date units for present obsolete shop machinery and tools, in the opinion of L. F. Loree, president, Delaware & Hudson Railroad. Without embarrassment in handling the present volume of traffic, he estimates the carriers may save \$137,500,000 annually in the reduction of their stock of locomotives and cars owing to the fact that a large percentage is obsolete and is maintained unnecessarily. Over a period of time, a further saving of at least \$100,000,000 annually, he believes, may be accomplished in the improvement of grades and alinement, heavier rail and ballast, reduced distances, improvement of terminal facilities and practices, etc., upon 26,000 miles, or 10 per cent of the total upon which one-half the business is done.

These are portions of a total annual saving in expense of \$1,462,600,000 which, Mr. Loree says, can be made by carriers of the country which are declared to have reached a point where their situation has come to be recognized as acute and warranting emergency treatment. This is necessary, he points out, from the standpoint of public interest, together with the interest of railroad security holders and railroad employees.

Favors Rate Reductions

Mr. Loree declares that under present depressed conditions, the public should have reduction in both passenger and freight rates, and mapped out a program in order that his suggestions may be accomplished quickly, avoiding long delays from controversial questions, such as consolidation plans, hearings before committees, litigation, and the embarrassment of a lack of financial resources.

The first step proposed by Mr. Loree is the elimination of wasteful practices on the part of railroads, which, for competitive reasons, provide service to the public and which, on account of the depressed conditions and high rates, both passenger and freight, are declared not to be justified. He had reference to unnecessary and duplicated passenger service as well as unnecessary and duplicated freight service. In these items alone, he declares, a conservative figure of annual savings in expense is \$600,000,000.

Other estimated annual savings,

abstracted from the detailed statement of Mr. Loree, follow:

Abandonment of at least 30,000 miles of unnecessary rail mileage—\$75,000,000.

Revision of working agreements with various branches of railroad labor—\$100,000,000.

Reduction of 25 per cent in railroad property investment and taxation—\$90,000,000.

Cooperation between railroads and public authorities looking to remedying of such matters as valuation expenses, depreciation charges, restrictive laws, including automatic train control, full crew and train limit laws, non-productive property charges, land grants, etc.—\$282,100,000.

Profits Could Be Shown in 1933

Mr. Loree says that without the radical measures suggested it seems

Freight Reductions on Iron, Steel May be Asked

WASHINGTON, April 11.—General reductions in freight rates on iron and steel products probably will be asked of the Interstate Commerce Commission at hearings to begin here April 24. The proceedings, to be conducted by a special division of the commission, composed of Commissioners Atchison, Porter and Lee, have been instituted as the result of a joint memorial filed by coal, lumber and agricultural groups seeking lower freight rates.

The petition asked for cuts in rates on basic commodities, but in its order the commission broadened the inquiry to include all freight rates and charges.

While the iron and steel industry has not been active in seeking rate cuts, it shares the view, as do a growing number of railroad executives, that rates are entirely out of line with commodity prices and are an element in holding back business.

Stainless Clad Steel Milk Truck

(Concluded from Page 579)

A novel method is used to apply 2 in. of insulation to the outside of the tank. It is simply sprayed on by air, thereby assuring a skin-tight fit to all surfaces of the tank and outlets. This insulation consists of a mixture

likely that the showing of the railroads in 1933 will not be better than that in 1932, when they reported a net income deficit of \$153,000,000. On the other hand, he points out, if the savings estimated were made effective, enough could be realized for Class I railroads in 1933 to change the red figure to a black figure of large proportion. He explains that the total outstanding capital stock of Class I railroads is approximately \$8,270,000,000, and that 5 per cent dividends on this stock would amount to \$413,500,000, leaving a balance of \$851,100,000, when the latest saving of \$1,462,600,000 was realized.

"These estimated excess earnings," says Mr. Loree, "would permit the elimination of the present emergency freight charges," netting approximately \$61,600,000, leaving a balance which might be used for such improvements as are necessarily chargeable to surplus for development and strengthening of the significant parts of the properties, applying in the reduction of passenger fares and freight rates of something like \$700,000,000."

of paper, asbestos fiber, granulated balsam wood and a quick drying asphalt binder. This mass remains plastic after application.

Tanks that recently have been completed have been covered with 16-gage aluminum sheets, welded in place, the seams being located so they are covered by the tank bands. Experiments are now being conducted and it will be only a matter of time before 20-gage stainless clad steel will be used for the outside covering. Considering the tank as a unit it is essentially a large thermos bottle. The outlet valve was made of stainless steel and the manhole and cover were made of stainless clad steel.

Coming Meetings

April

American Management Association. April 13 and 14. Job order production and mass production division meetings, Hotel Statler, Cleveland. John W. Goetz, 20 Vesey Street, New York, managing director.

American Zinc Institute. April 18. Annual meeting, New York. Julian D. Conover, Lincoln Building, New York, secretary.

National Foreign Trade Council. April 26 to 28. Annual meeting, William Penn Hotel, Pittsburgh. Gardner L. Harding, India House, Hanover Square, New York, secretary.

American Welding Society. April 27 and 28. Annual meeting, Engineering Society's Building, New York. M. M. Kelly, 29 West Thirty-ninth Street, New York, secretary.

... PERSONALS ...

HAROLD D. NORTH, formerly vice-president and sales manager of the Ferry Cap & Set Screw Co., Cleveland, has been elected president of that company, succeeding the late **Thomas Ferry**. Mr. North has been connected with the company since leaving Cornell University in 1907. He is well known throughout the automotive industry and in the mill supply and hardware jobbing trade. **E. W. FERRY**, son of the late president, has been elected vice-president and secretary. He has been connected with the company a number of years and is in charge of cost production and plant operations. **GEORGE W. NORTH**, one of the founders, is treasurer of the company.

♦ ♦ ♦

G. F. WILSON, **GUSTAF PETERSON** and **S. B. MATHEWS**, until recently members of Ludlum Steel Co., Philadelphia district organization, have formed a new company to be known as Delaware Steel Service, Inc., which will represent, among others, the Ludlum Steel Co. Complete lines of all principal Ludlum products will be carried.

♦ ♦ ♦

GERALD FIRTH, general manager of Firth-Sterling Steel Co., McKeesport, Pa., sailed for Europe April 5. He will visit Sheffield and other steel-making centers in Europe.

♦ ♦ ♦

JAMES INGLIS, president American Blower Corp., Detroit, has been named chairman of the board of the newly-formed National Bank of Detroit, the capital of which was subscribed jointly by General Motors Corp. and the Reconstruction Finance Corp.

♦ ♦ ♦

R. C. DENNY has been appointed chief engineer of the stoker division of the Patterson Foundry & Machine Co., East Liverpool, Ohio. Mr. Denny has been identified with stoker and furnace work for more than 15 years, having been connected with the Combustion Engineering Corp., New York, and the M. H. Deitrich Co., Chicago.

♦ ♦ ♦

D. H. LOCKE has been appointed vice-president and general manager of manufacturing of the Dominion Radiator & Boiler Co., Ltd., Toronto, Canada, the Canadian division of the American Radiator & Standard Sanitary Corp. His new duties will be in addition to those of his present position as vice-president and general manager of manufacturing of the American Radiator Co.

♦ ♦ ♦

HARRY J. FISHER, formerly sales manager of the Aetna Standard En-



H. D. NORTH

gineering Co., Youngstown, has established himself and associates as distributor in Ohio, with headquarters in Cleveland, for the Clark Controller Co. Prior to his connection with the Aetna company, Mr. Fisher was identified in a sales capacity with the Reliance Electric & Engineering Co., Cleveland.

♦ ♦ ♦

GEORGE C. COSSABOOM has been appointed Detroit district representative for the Mills Co., Cleveland, maker of metal partitions. He will make his headquarters at 199 Tennyson Avenue, Detroit.

♦ ♦ ♦

HOWARD K. RIGDON and **HOWARD MCCLELLAND**, formerly associated with the Republic Steel Corp.,



ROY C. MUIR, new manager of the engineering department of the General Electric Co., who, as announced in these columns last week, has direct charge of the company's designing engineering in all of its various plants.

Youngstown, have been named sales representatives, with offices in the Guarantee Title and Trust Building, Cleveland, for the Great Lakes district by Hiram Swank's Sons, Inc., Van Dyke Silica Brick Co., and the Bessemer Brick Co., all of Johnstown, Pa.

♦ ♦ ♦

C. D. LEGENDRE has been appointed credit manager for the Southern district of the Republic Steel Corp. at Birmingham, to fill the vacancy caused by the death of H. H. Martin on March 12, as previously reported. Mr. Legendre was assistant to Mr. Martin and has been in the Birmingham office of the company for the past seven years.

♦ ♦ ♦

L. T. McCLOSKEY has resigned as vice-president of Continental-Diamond Fibre Co., to become associated with Taylor & Co., Inc., Norristown, Pa., maker of vulcanized fiber and phenol fiber.

♦ ♦ ♦

H. L. DEMPSTER has been elected president and general manager of the Dempster Mill Mfg. Co., Beatrice, Neb., maker of agricultural implements. He succeeds his father, the late C. B. Dempster. **CLYDE B. DEMPSTER** has become vice-president, and **J. C. HARMON** has been elected a director.

♦ ♦ ♦

WALTER F. BROWN, Toledo, postmaster general under the Hoover Administration, was elected president of the Cleveland Automatic Machine Co., Cleveland, to succeed the late A. F. Garford at the annual meeting of stockholders on April 8. Mr. Brown formerly was vice-president as well as a director. **HERBERT E. NUNN**, who has been in charge of sales in the Chicago district, was elected vice-president in charge of sales. **A. L. PATRICK** and **DAVID L. JOHNSON** were reelected as treasurer and secretary respectively. **S. D. WRIGHT**, president, Atlas Car & Mfg. Co., Cleveland, and **JOHN P. WITT**, Cleveland broker, were elected to the board of directors to fill the vacancies caused by the death of Mr. Garford and the resignation of **L. B. BECKWITH**, Toledo, the two new members being selected as representatives of a preferred stockholders protective committee.

♦ ♦ ♦

OSKAR WALDRICH, head of H. A. Waldrich G. m.b.H., Siegen, Germany, machine tool works, has received the honorary degree of Doctor of Engineering from the Technical University of Karlsruhe.

♦ ♦ ♦

JAMES STOKOE has been made president of the Hydro-Ash Corp., Chicago, maker of ash handling equipment.

♦ ♦ ♦

A. S. KENNEDY has been appointed manager of the new branch office in Kansas City of the Chain Belt Co., Milwaukee. He is a graduate of the

OBITUARY

school of mechanical engineering of the University of Kansas and for the past five years has been engaged as a sales engineer covering Missouri, Kansas and Nebraska in the sale of handling equipment.

Elihu Thomson, Welding Pioneer, Honored

A testimonial dinner in observance of the eightieth birthday of Dr. Elihu Thomson, pioneer in electrical science, was held March 29 at the Massachusetts Institute of Technology, Cambridge, Mass., of which he was acting president from 1920 to 1922. Leaders in science, engineering and education paid tribute to the important part played by Dr. Thomson in the development of the country's electrical industry.

In the afternoon preceding the birthday dinner, there was a confer-



ELIHU THOMSON

ence at which brief lectures on the historical development of the applications of electricity, modern theories and present trends of research were presented. Many models and some of the originals of Dr. Thomson's inventions were exhibited as part of the celebration. These included his first electrical resistance welding transformer. Some of the addresses at the dinner were heard in a nation-wide radio broadcast.

Dr. Thomson is the last of the "big four," which included Thomas A. Edison, Charles F. Brush and James K. Wood, all of whom between 1878 and 1882 successfully started electric light systems. The entire development of the electrical industry and the whole history of the General Electric Co., of which he was one of the founders, have come to pass since Dr. Thomson was 25 years old. He has more than 700 United States patents to his credit. In addition to numerous medals and college degrees, Dr. Thomson has received the Hughes, Kelvin and Faraday medals, high British honors.

LEE H. MILLER, chief engineer of the American Institute of Steel Construction, died at St. Luke's Hospital, Cleveland, on April 9, aged 56 years. He had been actively identified with structural steel work with various large corporations for more than 25 years. He was born in Canada and was graduated from the school of applied science and engineering of Toronto University in 1900. After his graduation he went to Pittsburgh and practiced his profession as a structural steel draftsman. The following year he located in Cleveland, where he spent eight years with the Brown Hoisting Machinery Co., the Wellman-Seaver Engineering Co., and the McMyler Co., in estimating and designing structural steel work. From 1908 to 1922 he was structural sales agent for the Bethlehem Steel Co. in Cleveland. In 1922 Mr. Miller started the work of the organization of the American Institute of Steel Construction in the capacity of managing director. The following year Mr. Miller was appointed chief engineer of the institute with offices in Cleveland. Mr. Miller was the author of a handbook of structural steel specifications, which is used as a textbook in many technical schools and as a standard reference book by many steel companies. He was also the author of the structural steel building code now used in many of the large American cities.

WALTER S. LIPPINCOTT, who had been prominently identified with the sales department of the Bethlehem Steel Co. in Philadelphia since 1907, died on April 5 at Hahnemann Hospital in that city. Mr. Lippincott was 50 years old. Funeral services were held from the home in Moorestown, N. J., last Saturday.

JOHN P. MCCANN, president, United Iron & Metal Co., Pittsburgh, died at his home in that city on April 6, following a long illness. He had been actively engaged in the scrap iron and steel business during the greater part of his business life, and had been associated with the United company for 15 years. The United company has been very active in the work of dismantling mills and bridges in the Pittsburgh district, and Mr. McCann had built up a wide acquaintance through this business.

WILLIAM D. HAMILTON, who prior to his retirement several years ago was president of the National Casket Co., Pittsburgh, died at his home in that city on April 2.

ALBERT W. HOPKINS, for many years sales manager of the National Acme Co., Cleveland, died suddenly April 4, aged 49 years. Four years



L. H. MILLER

ago he left the National Acme Co., with which he had been connected for 30 years, and for three years was associated with the Allied Products Co., Detroit. During the past year he had resided in Cleveland.

FRED BENNETT JONES, who until 1908 was vice-president of Adams & Westlake Co., Chicago, manufacturer of railroad supplies, died April 9, aged 75 years. Although retired from active service he was one of the largest stockholders in the Adams & Westlake Co. and had retained an active interest in all of its affairs.

ALBERT L. SEAMAN, sales representative in Chicago for the A. H. Wells Steel Co. and the National Sheet Metal Co., died March 23 at his home in Evanston, Ill. Mr. Seaman was 53 years old.

ROBERT M. HENDERSON, vice-president and general manager of the Walworth-Alabama Co., with plant at Attalla, Ala., died on March 19 in Birmingham, after an illness of several weeks. He had been connected with the foundry business since 1915, when he joined the National Pipe & Foundry Co., which was later sold to the Walworth Co., Boston, and continued as the Walworth-Alabama Co.

GEORGE H. GIBBY, founder of the Gibby Foundry Co., East Boston, and for a period operator of the old Smith & Anthony Stove Co., Wakefield, Mass., foundry, died at his home in Winthrop, Mass., March 30. He was born in Roxbury, a part of Boston, 71 years ago, and entered the foundry industry when he became of age. He served as treasurer of the New England Foundrymen's Association throughout its existence.

30-Hr., Five-Day Week Bill Meets With Strong Protests

Operation of Blast Furnaces and Steel Plants Would Be Seriously Affected—Constitutionality Issue Raised

WASHINGTON, April 11.—Branded by Senator Reed, Republican, of Pennsylvania, as unconstitutional, "a legislative absurdity," "sentimentalism run mad" and utterly unworkable, the Black 30-hr., five-day week bill has hit difficult snags. If it becomes a law at all, the measure, revolutionary in character, promises to do so only after it has been greatly modified.

Arbitrarily barring from interstate commerce products of industrial plants in which persons are employed more than 6 hr. a day or five days a week, the bill as drafted by Senator Black, Democrat, of Alabama, and passed last Thursday by the Senate by a vote of 53 to 30, would work particular, if not impossible, hardships upon steel works, blast furnaces and other continuous process industries.

Despite the fact that the measure was the object of hearings last winter before the Senate Committee on the Judiciary, it had been given little attention by many industries of the country. This was perhaps due to the belief that it would not be seriously considered or that it would be held unconstitutional if passed. When brought up in the Senate last week, it was the view of even its authors and other supporters that it would require prolonged discussion before being acted upon.

Protests Pour In

Its passage by the Senate therefore not only was a surprise to its sponsors, including the American Federation of Labor, but it created a stir throughout industries of the country. Protests previously made by them were greatly multiplied and began to pour in upon both members of the Senate and of the House. These had a sobering effect, especially so because protests came from many constituents of Senators who had supported the measure.

It was then held up from going to the House through a motion for reconsideration made by Senator Trammell, Democrat, of Florida, who announced he had a number of amendments he wanted to offer. One of them would restrict the importation of products to those manufactured according to the terms of the bill. This, it is readily agreed, would virtually bring about an embargo, but Senator Trammell declared he does "like the idea of a bill saying to the people at home they shall not be allowed to ship in interstate commerce under restrictions and then leave the door wide open to foreign-made goods without restriction."

A similar amendment was offered by Senator Hatfield, Republican, of West Virginia, and was defeated by one vote.

President's Views Sought

House leaders, meanwhile, are holding up the legislation. A measure similar in many respects to the Black bill has been introduced in the House by Representative Connery, but carries the import restriction. Speaker Rainey, realizing the strong reaction against the bill, said it probably would not be taken up for several weeks. He said also that it is desired to get the views of President Roosevelt regarding the measure before it is considered by the House. It was reported that President Roosevelt was favorable to an amendment offered by Senator Robinson, of Arkansas, majority leader, which called for a 36-hr. week and would have permitted working 8 hr. a day. Senator Robinson would only say he believed his amendment was "agreeable to the President." The amendment was quickly voted down.

Upon passage of the measure by the Senate, President Roosevelt asked Secretary of Commerce Roper and Secretary of Labor Perkins to make an investigation to determine the effect the bill would have upon industry. This is given as one reason for withholding House action. But it is clear also that many prominent Democrats as well as Republicans in the House are opposed to the bill, though if given Administration approval some of them probably would vote for it.

"There is a lot of dynamite in that bill," said Speaker Rainey, of Illinois. "There are a lot of complications. There is the question of constitutionality which might be submitted to the Judiciary Committee."

He also pointed out that the House bill includes the import restriction and when asked if this would not interfere with the President's negotiations for reciprocal tariffs said that that was another complication.

As passed by the Senate, the bill is limited to two years' operation, although Senator Black said he thought it would be constitutional to make the legislation permanent. Industry believes it later would be made permanent.

The bill does not cover agriculture, newspapers, periodicals, certain seasonal operations, and railroads; a separate railroad bill has been introduced by Senator Black providing for a 42-hr. week and fixing a minimum

wage. Senator Black omitted a minimum wage provision in the bill covering private industry because he said it would be unconstitutional.

The 30-hr. bill, he declared, was necessary because the nation has emerged into a new economic era and is wholly unprepared for the transition. Its purpose was said to be to restore men to work, and to build up purchasing power, held to be absolutely necessary if the country is to recover from the depression. His claim that it would return 6,000,000 men to work was challenged by Senator Gore that the estimate is fantastic.

"If that proves to be the case is it not obvious that the labor cost of manufactured articles is going to be increased 33 per cent?" inquired Senator Reed.

Senator Black said he hoped so. He expressed the opinion that the country will not "recover until the aggregate purchasing power of workers comes nearer in proportion to the profits that have been going to bloated capital."

"Is not the Senator in this dilemma, that either the bill is going to reduce wages, the real earning power of the working people, in these industries 33 per cent, or it is going to raise the cost of everything the farmer has to raise?" asked Senator Reed.

Senator Black responded that Senator Reed himself had said if commodity prices are not raised there can be no recovery. Senator Reed replied that he wanted them all raised uniformly, while the Black bill would raise some commodity prices against the consumers of the articles.

Speaking of the farm relief bill, Senator Reed told Senator Black that, "You attack the suffering city workmen by putting a 100 per cent sales tax on the necessities of life and by this bill you either cut down on that city workman's salary or you raise the prices of the farm products he has to buy."

Homer D. Williams Protests

In a telegram to Senator Reed strongly protesting against the Black bill, President Homer D. Williams of the Pittsburgh Steel Co. pointed out that the manufacture of steel, particularly the operation of blast furnaces, is a continuous process, working three shifts of 8 hr. each day. He said that working 6 hr. five days a week would so split up the hours that the total number of men would add at least 25 per cent to the labor cost and make it easier for foreign competition to ship goods into the United States. To meet foreign competition, it was stated, would require either higher tariff or reduction of earnings nearly equal to that of Europe. This surplus labor, Mr. Williams said, will only continue until the depression is over and then there will be in all probability a shortage of labor.

• • EDITORIAL COMMENT • •

The Thirty Hour Week . . .

THE Senate has passed the "Black Bill" (S.B. 158). This, if it passes the House and is signed by the President, will prohibit for two years the interstate or foreign shipment of any article produced in the United States in any mine, quarry, mill, cannery, workshop, factory or manufacturing establishment in which any person is permitted to work more than five days in any week or more than six hours in any day.

The motive back of this bill, of course, is to spread employment by putting "teeth" into an industrial "share-the-work movement." If it could be applied to the few but flagrant opportunists among employers who have seized the whip of the times to force longer hours and shorter pay upon their employees, respectable manufacturers would welcome it. Unfortunately, it is not discriminatory. It promises to hurt more than it helps.

Manufacturing industry in the United States is now on a basis of profitless operation, despite wage reductions. The exceptions are so few as merely to prove the rule. A 25 per cent curtailment in working hours, under these conditions, inevitably means a similar reduction of income of those now employed. There being no profits, this dole must come from wages. It means lowering the employed worker's standard of living another 25 per cent.

Even if labor in our industry were inclined to accept this automatic reduction in pay, the industry could not accept the six-hour day. There may be jobs where the worker can drop his tools when the whistle blows, but the hot metal industry is an exception. Heats do not always conform to the ticking of the clock.

By and large, it would be difficult to name an industry which has had a cleaner and clearer record of dividing available work among its workmen than the steel industry. It was among the first to apply the principle of work rotation, and it was among the last to reduce hourly wage rates. The industry is now employing more men than it can afford to, measured from a profit or even from a self-preservation standpoint. It has been motivated in this by earnest humanitarian effort to mitigate the distress of its employees. To apply the unreasonable, crippling and indiscriminating restrictions of the "Black Bill" to this and similar industries would be to postpone, if not to prevent, the hoped for emergence from the levels of today. Legislation cannot create employment but it can overburden industries and thus reduce the number of still available jobs.

"Hope Springs Eternal" In Detroit . . .

WE have become so resigned to industrial operations of niggardly proportions that recent reports from Detroit are somewhat astonishing.

Retail automobile sales in March, particularly during the last 10 days, were far greater than sales execu-

tives had hoped for, despite the nation's curtailed banking facilities. Automobile factory operations have risen rapidly from the zero point where they stood during the middle of last month. Still hewing close to the sales line and taking no chances on excessive dealer stocks, leading motor car manufacturers nevertheless have jumped April assemblies far beyond the mark set at the beginning of the month.

Chevrolet, Ford and Plymouth, the three volume leaders, are planning to operate five days a week all month. Ford's motor assembly plant ran six days last week for the first time in almost a year. The Dodge truck plant is operating a full six days a week with production 700 units behind orders.

Admittedly it is too early to appraise the effect of this unexpected revival in one of the country's key industries. However, it is heartening to see this burst of activity at a time when the country desperately needs a peg on which to hang its hopes for an economic comeback in the not too distant future.

Airships and Manganese . . .

THE tragic loss of the Navy dirigible Akron has again directed attention to our expenditures for national defense. The question that has been raised is not merely whether further expenditures for mammoth airships are warranted but whether large outlays should continue to be made for war equipment to the exclusion of essential war materials.

In the field of metals, our lack of manganese, tin and antimony would prove extremely embarrassing and possibly disastrous if we became involved in a sudden conflict. Shortage of manganese is the Achilles heel of our steel industry, the industry which is the very backbone of our national defense. In 1916, 1917 and 1918 we imported 1,697,596 gross tons of high-grade manganese ore, or an average of 565,865 tons per year. Prices skyrocketed during that period, rising well above \$1 per unit in 1918. The average annual cost of importations in the three years was about \$27,000,000. Today, an equal quantity (a year's supply measured by imports in those years) could be bought for \$11,300,000, including a duty which did not exist during the war. If the Government, in the interest of preparedness, should decide to buy that much manganese to hold for emergencies, it is inconceivable that it would charge itself the duty. Without duty the cost would be reduced to about \$5,000,000.

Even if such a quantity could not be accumulated without raising prices somewhat, the investment would surely be in the interests of economy and public safety. The Akron cost \$3,900,000 to build and \$75,000 to inflate. The outlay of nearly \$4,000,000 would have gone a long way toward purchasing a year's supply of manganese.

Steel Ingot Output Declined 26 Per Cent in March

STEEL ingot production in March, at 32,812 tons a day, showed a decline of 26 per cent from the February daily rate of 44,431 tons (revised). The recession contrasts with a gain in the previous month of 14.7 per cent.

March operations were computed by the American Iron and Steel Institute as representing 15.08 per cent of capacity. This compares with 20.41 per cent in February and with 15 per cent in December. The depression low was 14.20 per cent (revised) in August, 1932.

Total output in March was 867,132 tons, compared with 1,066,339 tons in February. The number of working days in March was 27, against 24 in February.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS

(Gross Tons)

Reported for 1932 by Companies Which Made 95.68 Per Cent of 1932 Ingot Output

1932	Open-Hearth	Bessemer	Calculated Output All Companies		No. of Working Days	Per Cent Operation
			Monthly	Daily		
January	1,230,907	160,633	1,454,309	55,935	26	25.86
February	1,230,970	157,067	1,450,648	58,026	25	26.85
March	1,149,193	193,944	1,403,723	51,990	27	24.04
April	1,036,163	144,197	1,233,603	47,446	26	21.94
May	950,838	103,593	1,101,994	42,384	26	19.60
June	755,068	100,249	893,899	34,381	26	15.90
July	653,039	102,916	790,055	31,602	25	14.61
August	696,122	97,323	829,236	30,712	27	14.20
September	804,470	124,970	971,365	37,360	26	17.28
October	885,773	132,876	1,064,598	40,946	26	18.93
November	838,419	128,844	1,010,894	38,881	26	17.98
December	724,917	81,932	843,244	32,432	26	15.00
Total	10,955,879	1,528,544	13,047,568	41,819	312	19.34

The figures of "per cent of operation" are based on the annual capacity as of Dec. 31, 1931, of 67,473,630 gross tons for Bessemer and open-hearth steel ingots.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS

(Gross Tons)

Reported for 1933 by Companies Which Made 97.88 Per Cent of 1932 Ingot Output

1933	Open-Hearth	Bessemer	Calculated Output All Companies		No. of Working Days	Per Cent Operation
			Monthly	Daily		
January	879,082	109,000	1,009,483	38,826	26	17.84
February	916,952	126,781	1,066,339	44,431	24	20.41
March	772,623	94,509	885,913	32,812	27	15.08
Three Months	2,568,657	330,290	2,961,735	38,464	77	17.67

The figures of "per cent of operation" are based on the annual capacity as of Dec. 31, 1931, of 67,473,630 gross tons for Bessemer and open-hearth steel ingots.

All monthly production figures except for October, 1932, and March, 1933, are revised. All calculated outputs and operating percentages except for March, 1933, are adjusted.

British Steel Industry Faces Changes

The situation which the British steel industry faces was discussed recently in two notable addresses. One was by Charles Mitchell, chairman of Dorman, Long & Co., Ltd., leading British steel maker, and chairman also of the National Committee for the Iron and Steel Industry, a body which has apparently completed its investigation of the status of British steel, but whose report has not yet become available. The other was by Sir William J. Larke, director of the National Federation of Iron and Steel Manufacturers, who headed the British steel delegation to the Ottawa economic conference last fall.

Mr. Mitchell, at a meeting of the London Iron and Steel Exchange, said the old idea of individual ownership must go and that "by cooperation an endeavor must be made, first to bring down the cost of production to a degree which could enable the consumer to be supplied at a reasonable price, and, second, to regain our rightful position in the world's markets." He regarded it as essential to concentrate the production of iron and steel at those units which for geographical reasons, for reasons of natural resources or because of labor conditions or any other factors, are the most desirable for the purpose of manufacturing a particular product.

Sir William, asserting that the British industry still led the world

in technological advances, said the immediate problem was economic and related to distribution. The industry, he contended, was suffering from under-consumption. He stated that the saturation point had not been reached; but instead the outlook was for a greater consumption than in the pre-war years.

Increased Fuel Efficiency in Steel Making

A marked increase in fuel economy in the manufacture of steel in the United Kingdom has been effected in recent years, according to the annual report of the Department of Scientific and Industrial Research of Great Britain for 1931-32. In 1924 there were consumed in iron and steel works for purposes other than pig iron production 10.34 million tons of coal. The output of finished steel was 6,708,500 tons, so that the rate per ton of finished steel was 3450 lb. In 1930, 7.1 million tons of coal were used in the production of 6,120,000 tons of finished steel, or 2600 lb. of coal per ton of steel. A saving of nearly 25 per cent is thus indicated.

Ohmer Register Co., Dayton, Ohio, has announced that an encouraging upturn in the company's business was apparent by the receipt of substantial orders for fare registers, cash registers, taximeters and other recording devices.

To Discuss Set-Up Time and Inventory Turnover

Production economies secured from reduction of set-up time and the speeding up of turnover of manufacturing inventory will be discussed at a job production conference and a mass production conference to be held by the American Management Association at the Hotel Statler, Cleveland, April 13.

Addresses on "Product Design and Its Influence on Set-Up Time," by Tell Berna, sales manager, National Acme Co., and W. D. Teague, industrial designer, are scheduled for the opening session. These will be followed by a paper on "The Effect of Proper Selection of Machines and Equipment on Set-Up Time," by A. J. Brandt. Afternoon sessions to be devoted to what the foreman can contribute and what the use of time and motion study can contribute to reducing set-up time.

Papers at the mass production conference, April 14, include "Analyzing Purchasing Policies in Speeding Up Inventory Turnover," by R. M. Bowman, Republic Steel Corp., and "Production Methods to Speed Up Turnover," by Dr. Walter Rautenstrauch, professor of industrial engineering, Columbia University, and by C. S. Carney, Trundle Engineering Co. Chapin Hoskins, managing editor, *Forbes Magazine*, will talk on "There Isn't Any Bottom to Costs." The final session will be devoted to "Case Studies on Reducing Prices While Retaining or Improving Quality."

SUMMARY OF THE WEEK'S BUSINESS

Steel Production Up to 19½ Per Cent In Sharpest Rise of This Year

Automobile Industry Takes Quick Upturn—Tin Plate Rollings Heavier—
Bar and Sheet Orders Gain—Pittsburgh Scrap Highest in a Year

IN the sharpest gain that has occurred in any week this year, steel ingot production for the country as a whole has risen to 19½ per cent of capacity from 16½ per cent a week ago. This brings steel operations nearly up to the February average of 20.41 per cent, from which there was a drop to 15.08 per cent in March, brought about largely by the nationwide closing of banks.

While the marked increase in steel output is largely the result of an upturn in automobile manufacturing schedules, particularly by Chevrolet and Ford, there has also been improvement in other lines, notably tin plate for can manufacture. Orders for sheets for beer barrels and beer bottle cases have contributed in some measure to the betterment. Miscellaneous business has gained, especially in bars and sheets, which are the two steel products of widest usage, their combined total normally representing about 30 per cent or more of all finished steel production.

The Chicago district has shown the greatest advance, from 13 per cent in the early part of last week to 19 per cent this week, aided by fairly large orders for sheets and bars and a recent release of a small tonnage of rails. The Erie Railroad order for 24,549 tons of rails for delivery in monthly instalments from now until July will bring about an increase in Pittsburgh district steel output within the next two weeks, the Carnegie rail mill, which has been idle, having obtained about two-thirds of the tonnage.

There is a gain in the Pittsburgh district this week to 15 per cent from 13 per cent last week, while Valley and northern Ohio output is up to 18 per cent against last week's average of 14 per cent. A stepping up has also occurred at Birmingham, Buffalo, in eastern Pennsylvania and at Detroit, where the independent steel plant is operating five of its six open-hearth furnaces, or about 84 per cent of capacity, with the possibility of full operation soon.

Sheet mills in the Chicago district are averaging about 40 per cent and a few bar mill units are up to 30 per cent. Sheet mill operation in the entire country is estimated at 22 per cent.

ACCOMPANYING the expansion of production is a further strengthening of steel scrap prices at Pittsburgh, all steel-making grades being up at least 50c. a ton. Heavy melting scrap is quoted at an average of \$10 a ton, the best price in that district in a year. A syndicate of scrap dealers has disposed of

the larger part of 200,000 tons of material it will derive from the scrapping of about 16,000 freight cars and 100 locomotives of the Southern Railway.

Price strength is in evidence in pig iron markets. An advance of 50c. a ton has been announced by Lake Erie furnaces for shipment outside their own immediate districts, and a Pittsburgh merchant furnace has advanced Bessemer iron a like amount.

Non-ferrous markets, which had sharp price rises after the reopening of banks, only to lose them later, have again reacted on the up side. Lead is \$5 a ton higher, zinc is up \$2 a ton, copper has gained ⅝c. a lb., and tin has continued its recent strength.

Finished steel prices have shown no change, but makers of wrought iron pipe have announced reductions of \$10 to \$20 a ton, following similar declines on steel pipe a week or so ago.

ALTHOUGH steel companies find it difficult to measure the probable demands of the immediate future, they are hopeful of continued improvement, particularly if plans now under consideration at Washington materialize soon. If the railroad problem is solved by Government action, an early release of considerable steel tonnage is expected, as railroads are known to have an accumulation of requirements in rails, track supplies and car repair material. The Erie rail business, it is believed, may be the signal for other rail orders soon.

Stimulation of building activity is also waiting upon Washington action on the proposed \$3,000,000,000 bond issue and on the proposed Navy program. Private construction work is of little account, and dependence must be placed on public work. The week's lettings of fabricated structural steel were only 7000 tons, but new projects total 17,200 tons, of which 11,500 tons is for a bridge over the Niagara River.

The rapidity with which the automobile industry has expanded production has been a surprise to the steel industry. Output of motor cars this month is estimated at 150,000 units, against 130,114 in January and 106,814 in February. Automobile companies expect a rising trend at least through May and June.

A gasoline-carrying pipe line from Toledo to Detroit, to be built jointly by the Pure Oil Co. and the Sun Oil Co., which has been pending for some time, will now go ahead. The line will require 80 miles of 6-in. pipe, about 5000 tons, which probably will be divided between two leading makers.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron	Apr. 11, 1933	Apr. 4, 1933	Mar. 14, 1933	Apr. 12, 1932
Per Gross Ton:				
No. 2 fdy., Philadelphia.....	\$14.34	\$14.34	\$13.34	\$15.59
No. 2, Valley furnace.....	14.50	14.50	14.50	15.00
No. 2 Southern, Cin'ti.....	13.82	13.82	13.82	13.82
No. 2, Birmingham.....	11.00	11.00	11.00	11.00
No. 2 foundry, Chicago*.....	15.50	15.50	15.50	16.00
Basic, del'd eastern Pa.....	14.09	14.09	13.50	16.00
Basic, Valley furnace.....	13.50	13.50	13.50	14.50
Valley Bessemer, del'd P'gh..	16.89	16.89	16.89	17.39
Malleable, Chicago*.....	15.50	15.50	15.50	16.00
Malleable, Valley.....	14.50	14.50	14.50	15.50
L. S. charcoal, Chicago.....	23.17	23.17	23.17	23.17
Ferromanganese, seab'd car-lots	\$68.00	68.00	68.00	75.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Contract price; spot quotation.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill.....	\$40.00	\$40.00	\$40.00	\$43.00
Light rails at mill.....	30.00	30.00	30.00	34.00
Rerolling billets, Pittsburgh.	26.00	26.00	26.00	27.00
Sheet bars, Pittsburgh.....	26.00	26.00	26.00	26.00
Slabs, Pittsburgh.....	26.00	26.00	26.00	27.00
Forging billets, Pittsburgh..	31.00	31.00	31.00	33.00
Wire rods, Pittsburgh.....	35.00	35.00	35.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh. lb..	1.60	1.60	1.60	1.50

Finished Steel

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.60	1.60	1.60	1.60
Bars, Chicago.....	1.70	1.70	1.70	1.70
Bars, Cleveland.....	1.65	1.65	1.65	1.65
Bars, New York.....	1.95	1.95	1.95	1.95
Tank plates, Pittsburgh.....	1.60	1.60	1.60	1.60
Tank plates, Chicago.....	1.70	1.70	1.70	1.70
Tank plates, New York.....	1.598	1.598	1.648	1.898
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.60
Structural shapes, Chicago...	1.70	1.70	1.70	1.70
Structural shapes, New York.	1.86775	1.86775	1.86775	1.86775
Cold-finished bars, Pittsburgh	1.70	1.70	1.70	2.00
Hot-rolled strips, Pittsburgh.	1.45	1.45	1.45	1.40
Cold-rolled strips, Pittsburgh	1.80	1.80	1.80	2.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Finished Steel

Per Lb. to Large Buyers:	Apr. 11, 1933	Apr. 4, 1933	Mar. 14, 1933	Apr. 12, 1932
	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.00	2.00	2.00	2.20
Hot-rolled annealed sheets, No. 24, Chicago dist. mill..	2.10	2.10	2.10	2.30
Sheets, galv., No. 24, P'gh..	2.60	2.60	2.60	2.85
Sheets, galv., No. 24, Chicago dist. mill.....	2.70	2.70	2.70	2.95
Hot-rolled sheets, No. 10, Pittsburgh	1.40	1.40	1.40	1.55
Hot-rolled sheets, No. 10, Chicago dist. mill.....	1.50	1.50	1.50	1.65
Wire nails, Pittsburgh.....	1.85	1.85	1.85	1.95
Wire nails, Chicago dist. mill	1.90	1.90	1.90	2.00
Plain wire, Pittsburgh.....	2.10	2.10	2.10	2.20
Plain wire, Chicago dist. mill.	2.15	2.15	2.15	2.25
Barbed wire, galv., P'gh....	2.35	2.35	2.35	2.60
Barbed wire, galv., Chicago dist. mill.....	2.40	2.40	2.40	2.65
Tin plate, 100 lb. box, P'gh..	\$4.25	\$4.25	\$4.25	\$4.75

Old Material

Per Gross Ton:				
Heavy melting steel, P'gh....	\$10.00	\$9.25	\$8.75	\$10.25
Heavy melting steel, Phila...	6.75	6.75	6.75	7.25
Heavy melting steel, Ch'go...	5.25	5.25	5.25	7.12½
Carwheels, Chicago.....	8.00	8.00	8.00	7.00
Carwheels, Philadelphia.....	8.50	8.50	8.00	9.50
No. 1 cast, Pittsburgh.....	9.00	9.00	9.00	9.50
No. 1 cast, Philadelphia.....	8.00	8.00	8.00	9.50
No. 1 cast, Ch'go (net ton)...	6.75	6.75	6.25	7.00
No. 1 RR. wrot., Phila.....	7.50	7.50	7.50	8.50
No. 1 RR. wrot., Ch'go (net)	4.50	4.50	4.50	5.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt.....	\$1.75	\$1.75	\$1.75	\$2.25
Foundry coke, prompt.....	2.50	2.50	2.50	3.50

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery..	5.12½	4.75	5.75	5.50
Lake copper, New York.....	5.50	5.00	5.50	6.00
Tin (Straits), New York.....	25.50	24.90	24.12½	18.50
Zinc, East St. Louis.....	3.10	3.00	3.20	2.80
Zinc, New York.....	3.47	3.37	3.57	3.17
Lead, St. Louis.....	3.12½	2.87½	3.22½	2.90
Lead, New York.....	3.25	3.00	3.35	3.00
Antimony (Asiatic), N. Y....	5.95	5.80	6.25	6.00

▲▲▲ The Iron Age Composite Prices ▲▲▲

Finished Steel

April 11, 1933	1.879c. a Lb.
One week ago	1.879c.
One month ago	1.923c.
One year ago	1.970c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot rolled strip. These products make 85 per cent of the United States output.

	High	Low		High	Low
1933	1.948c., Jan. 3;	1.879c., Apr. 4			
1932	1.977c., Oct. 4;	1.926c., Feb. 2			
1931	2.037c., Jan. 13;	1.945c., Dec. 29			
1930	2.273c., Jan. 7;	2.018c., Dec. 9			
1929	2.317c., April 2;	2.273c., Oct. 29			
1928	2.286c., Dec. 11;	2.217c., July 17			
1927	2.402c., Jan. 4;	2.212c., Nov. 1			

Pig Iron

\$13.68 a Gross Ton
13.68
13.56
14.35

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low		High	Low
1933	\$13.68, Apr. 4;	\$13.56, Jan. 3			
1932	14.81, Jan. 5;	13.56, Dec. 6			
1931	15.90, Jan. 6;	14.79, Dec. 15			
1930	18.21, Jan. 7;	15.90, Dec. 16			
1929	18.71, May 14;	18.21, Dec. 17			
1928	18.59, Nov. 27;	17.04, July 24			
1927	19.71, Jan. 4;	17.54, Nov. 1			

Steel Scrap

\$7.33 a Gross Ton
7.08
6.92
8.21

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	High	Low		High	Low
1933	\$7.33, Apr. 11;	\$6.75, Jan. 3			
1932	8.50, Jan. 12;	6.42, July 5			
1931	11.33, Jan. 6;	8.50, Dec. 29			
1930	15.00, Feb. 18;	11.25, Dec. 9			
1929	17.58, Jan. 29;	14.08, Dec. 3			
1928	16.50, Dec. 31;	13.08, July 2			
1927	15.25, Jan. 11;	13.08, Nov. 22			

Pittsburgh Steel Output Gains; Valley Operations Also Higher

Carnegie Rail Mill Will Begin Rolling Soon on Erie Order—
Scrap Prices Advance

PITTSBURGH, April 11. — The promise of improved finished steel orders indicated a week ago has been realized to some extent, and business in the last few days has been definitely better with practically all of the companies in this district.

Releases from the automotive industry have gained, affecting sheet, strip and bar orders, and miscellaneous demand from small manufacturing consumers has shown a widely diversified improvement. Warmer weather has stimulated movement of reinforcing bars, light structural shapes and road mesh. The placing of 24,549 tons of rails by the Erie may be the forerunner of improved railroad demand. At least two-thirds of this rail tonnage went to the local mill, which may get into production before the end of the month.

Steel ingot production in the district has been stepped up to 15 per cent of capacity, with improvement fairly well divided between the smaller units and the two leading producers. Only one of the independent open-hearth plants in the district is now inactive, and it will probably resume next week. Production in Valley and nearby northern Ohio plants has increased to 18 per cent, while output in the Wheeling district is easily maintained.

Sheet mills are occupied this week at 22 per cent of capacity, while tin plate production has risen to 45 per cent. Bars, strip and plate mills are somewhat more actively engaged. Orders for pipe are rather sharply curtailed because of uncertainty in the oil industry.

Price changes during the week include a reduction in wrought iron pipe quotations of approximately the same extent as the recent drop in steel pipe prices. Makers of copper-bearing iron pipe have also adjusted their quotations. New extra cards on plates contain no major changes, except a recognition of trade practices heretofore in operation. Sheet quotations are well maintained.

Scrap prices have advanced further, and pig iron quotations have been stabilized at current levels, except in the case of Bessemer iron at Pittsburgh, which has been advanced 50c. a ton.

Pig Iron

The Pittsburgh merchant producer has advanced the price of Bessemer iron 50c. a ton to \$15.50, Neville Island furnace. The Valley price continues at \$15, and producers have made quotations on the new basis.

The price on foundry and malleable iron at Pittsburgh has been reaffirmed at \$15, while basic is quoted at \$14. Valley furnace prices are now being strictly adhered to. While no changes in quoted prices have been made, except in the case of Bessemer iron at Pittsburgh, lower quotations have generally been withdrawn, and a much stronger tone is evident in the market. The new set-up establishes the old relationship in grade differentials, which was in effect several years ago, and is expected to have a stabilizing influence on the market. The Westinghouse Air Brake Co. has purchased a tonnage of malleable iron. Edgewater Steel Co. has been inquiring for basic iron, but has made no purchase.

Semi-Finished Steel

No recent transactions in billets, slabs and sheet bars have been reported, but sellers are adhering strictly to the \$26, Pittsburgh or Youngstown, price in making quotations. Shipments are somewhat heavier. Forging billets are holding at \$31, and the \$35, Pittsburgh or Cleveland, price on wire rods is well established.

Rails and Track Accessories

The Erie Railroad has placed 24,549 tons of rails, allocated as follows: Carnegie Steel Co., 16,049 tons; Illinois Steel Co., 4500 tons; Bethlehem Steel Co., 2000 tons; Inland Steel Co., 2000 tons. No inquiry for accessories has appeared, but will probably follow the rail orders in a few days. Otherwise the market is very quiet.

Bars, Plates and Shapes

Miscellaneous demand for heavy hot-rolled products continues to show limited improvement. Small structural and reinforcing bar projects are appearing in better volume, and structural awards have been slightly heavier in the last week. Shipments of reinforcing bars for highway construction are gaining, and merchant and alloy steel bars going to the automotive and related industries are more active. Plates are rather quiet, although inquiry for barges is fairly substantial. As has been the case in the past, prospective buyers are hesitant about closing.

Prices on bars, plates and shapes are fairly well held at 1.60c., Pittsburgh. Makers of plates have issued new cards of extras, formerly recognizing a number of selling practices which have not been previously published. Extras for flame cutting on plates 2½ to 5 in. thick, inclusive, are

quoted for the first time, and established extras on other heavy grades are given formal recognition. Reinforcing bars are still quoted at 1.40c., Pittsburgh, for mill lengths, and less shading of the market is encountered than was the case a month ago.

Tubular Goods

The A. M. Byers Co. and the Reading Iron Co. have increased the discounts on wrought iron, black and galvanized, pipe, bringing about a reduction of \$7 and \$10 a ton, respectively in the net quotations on the base sizes. The change is in line with the reduction recently announced on steel pipe. Demand for steel pipe has been particularly quiet in the last few days, principally because of cessations of shipments to the oil country. Buyers in the oil industry are awaiting a definite proration program, before making further commitments, and demand for pipe from other sources is still lacking.

Wire Products

Improved shipments to the merchant trade are still a feature of this market, although the movement is now scarcely as heavy as was the case at the end of the quarter. Manufacturers are still taking wire in a limited way, although some improvement from the automotive industry is in evidence. Road mesh is beginning to move in slightly better volume. Wire and nail prices are well maintained.

Sheets

Demand for sheet mill products is well maintained, and operating schedules have improved sharply in the last week or two. Last week's production approximated about 19 per cent of the industry's capacity, and a 22 per cent average is scheduled for the current period. The greatest gains have been registered in full finished sheets going to the automotive industry, although galvanized material is in much better demand, and there is a better movement of hot-rolled stock to the barrel making trade. Prices are fairly well maintained on the general run of sheets, and upward revisions are in prospect if demand continues to improve.

Tin Plate

Production in the industry as a whole has risen to about 45 per cent of capacity, the rate which prevailed during the greater part of February. Shipments are improving, but the container manufacturers are hesitant in making commitments far in advance.

Strip Steel

Demand is definitely stronger, and some companies are receiving releases comparable to the rate which prevailed prior to the bank holiday. The wood barrel making industry is taking hoops in fair volume, but the automotive trade continues to provide most of the strip steel tonnage. Hot-rolled strip is generally held at 1.45c., Pitts-

burgh, while cold-rolled is still weak at 1.80c. to 2c.

Coal and Coke

The prospect of a central selling agency for western Pennsylvania coal operators, similar to Appalachian Coals, Inc., is a feature of the market this week. Most of the larger producers in the district seem to be willing to cooperate in this move, and formal steps toward the inauguration of such plans will be initiated this week. Producers of low volatile coal in the Central Pennsylvania district have already inaugurated such an agency. The coke market continues very quiet, with prices weak and unchanged.

Scrap

A Wheeling district consumer has contracted for approximately 80,000 tons of the heavy melting steel produced in the scrapping of freight cars and locomotives by the Southern Railway. The price has not been divulged, although the material is said

to have cost the dealers handling it approximately \$5 a gross ton, f.o.b. Memphis. A further charge will be added for dismantling the cars, as well as for barge transportation to the consuming mill. The Ashland, Ky., consumer has also contracted for a portion of the scrap to be produced by this program, and a substantial tonnage will go to a Birmingham consumer. The amount to be exported will probably be small and consist largely of specialties. Railroad heavy melting steel was sold to a Pittsburgh district consumer last week at \$10.50, and the Pennsylvania Railroad list brought better than \$10. Two consumers have also paid \$8.50 for No. 2 steel, while another bought for \$8.25. Dealers are paying as high as \$9.50 for hydraulic bundles for shipment to a nearby consuming point. Under the circumstances, the steel-making grades have all been marked up and sales of machine shop turnings have been at 25c. over recent quotations. Blast furnace scrap is slightly stronger.

other consumer is negotiating privately for 250 tons.

The scrap market has lapsed into inaction, higher prices for No. 1 heavy melting steel at Pittsburgh having failed to stimulate business here.

The cast iron pipe market is the brightest spot in Boston just now. Tonnages being booked are small, but there are quite a few of them.

Birmingham Steel Orders Show Moderate Gains

BIRMINGHAM, April 11.—The trend of the pig iron market is without change, bookings and shipments being small and irregular. In this district pig iron is not sharing the moderate improvement of steel. Foundry operations are very much restricted and little relief has yet been provided by pressure pipe, which is the only likely source for early improvement. Pipe plant operations have been slightly better in recent weeks but not enough to affect the pig iron market to any extent. Pipe bookings last week were small. During the present week there will be approximately 5000 tons up for bids, with St. Louis providing 3000 tons of this total. Blast furnace operations are confined to two stacks, the Tennessee company having one on basic iron and Woodward Iron Co. one on foundry. Southern quotations continue on a base of \$11. The Republic Steel Corp. has entered the commercial coal market and has booked approximately 140,000 tons of coal for the Seaboard Air Line Railroad.

Steel

The Ensley rail mill of the Tennessee Coal, Iron & Railroad Co. will resume operations on April 17 for one week to handle some small orders that have accumulated. This is in line with the policy announced some time ago of operating the mill for brief periods from time to time to handle small tonnages. Hot metal will be brought from the Fairfield works and no other units at Ensley will be worked. The rail mill has not been in production since late February.

Bookings of the two steel manufacturers in this district have been showing moderate gains in recent weeks. For one company, last week was the best in the past month or so. Orders are still small in size and mostly for prompt shipment. Both companies report that the first quarter was ahead of the same period last year. New business of fabricators of structural steel and reinforced bars is mostly small and occasional. For the second successive week there was an increase in open-hearth operations, six and seven being active throughout the week, as compared with five and six the preceding week. The schedule for the present week provides for seven.

British Home Demand Gaining; Continental Steel Prices Higher

LONDON, ENGLAND, April 10 (By Cable).—Domestic demand continues to expand, but export trade is still slow. Tin plate business is quiet, with output around

60 per cent of capacity, which soon will be reduced as some works are closing.

The Continental market is awaiting final details on sales syndicates and new prices for controlled products. Some works are now willing to book business, but buyers are inclined to hold back. Italy and Japan are still taking a considerable tonnage of Continental sheet bars. Business with consumers in the United Kingdom is lacking.

The Belgian Societe Metallurgique de Saint Eloi, at Thy-le-Chateau, is shutting down owing to the scarcity of orders for iron bars.

The French Government will assist French railways to place this year orders for locomotives and rolling stock totaling 500,000,000 fr. The business will go to French makers.

Buffalo Pig Iron Firmer In Boston Market

BOSTON, April 11.—Buffalo iron prices are firmer inasmuch as furnaces are quoting 25c. a ton differentials on No. 2X and No. 1X grades. A small amount of business was booked the past week at the new prices. There is some talk of higher Alabama iron prices, but there is nothing definite on the subject. Pig iron sales have dropped sharply, amounting to but a few hundred tons in the week, with truck lots predominating. The Crompton & Knowles Loom Works, Worcester, Mass., has not covered its 500-ton inquiry. An-

British Prices f.o.b. United Kingdom

Ports		Per Gross Ton	
Ferromanganese, export	£9		
Billets open-hearth	£5	to	£5 7s. 6d.
Black sheets, Japanese specifications	£11		
Tin plate, per base box	15s.	6d. to	16s.
Steel bars, open-hearth	£7 17½s.	to	£8 7½s.
Beams, open-hearth	£7 7½s.	to	£7 17½s.
Channels, open-hearth	£7 12½s.	to	£8 2½s.
Angles, open-hearth	£7 7½s.	to	£7 17½s.
Black sheets, No. 24 gage	£8 10s.		
Galvanized sheets, No. 24 gage	£10 10s.	to	£10 15s.

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £ at \$4.86

Billets, Thomas	£2 4s.
Wire rods, No. 5	
B.W.G.	£4 10s.
Black sheets, No. 31 gage, Japanese	£11 5s.
Steel bars, merchant	£2 15s.
Beams, Thomas	£2 7s.
Angles, Thomas	
4-in. and larger	£2 8s.
Angles, small	£2 10s.
Hoops and strip steel over 6-in. base	£3 10s.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4-pt. No. 10 B.W.G.	£8 15s.

Chicago Ingot Output Rises Sharply to 19 Per Cent

Bar and Sheet Mills Busier—Rail Mills Operating—Pig Iron Shipments Expanding

CHICAGO, April 11. — Chicago steel ingot output has climbed rapidly in the last few days and now tops 19 per cent of capacity, which is slightly more than the rate that prevailed at the time of the bank moratorium and nearly up to the best record this year.

Current specifications, the best of the year, carry some miscellaneous business, but by far the best releases are coming from automobile manufacturers. Rail releases add zest to the market. New buying is making a good showing and carries with it some mark of speculation, though sellers are trying hard to hold this phase of the market in check.

Some individual bar mills are producing at 30 per cent of capacity and some sheet units are close to 40 per cent.

A noticeable characteristic of the market is the firmness exhibited by prices.

Steel posts and fencing are again moving to farm areas, which are much encouraged over the increases in prices for farm products.

Railroad inquiry for track fastenings is improved, but structural steel seems to have touched a new low of inactivity.

The local scrap market is more or less at a dead level. Buying is light and shipments are of little consequence, but prices are firm and will need little encouragement to advance.

Pig Iron

Sales of Northern iron are steady, and fresh inquiry now before the trade is for not less than 10,000 tons in miscellaneous lots. A melter in Illinois will take 500 tons of low phosphorous iron, and a Wisconsin user will buy a like amount of foundry iron. Releases at hand indicate that April shipments will exceed those of March by at least 25 per cent. Prices are decidedly firmer in all directions from Chicago.

Cast Iron Pipe

Chicago's orders for 10,000 tons, awarded to two foundries, make the week outstanding in the cast iron pipe market. Appleton, Wis., has purchased a small lot. Bids will be taken this week at St. Louis on about 4000 tons. A number of small municipalities are inquiring for a few carloads each. On the whole, the tone of the market is improved. Prices are steady in and near Chicago.

Reinforcing Bars

Fresh inquiry is growing, but the pace is slow and most projects are

very small. The State of Illinois is taking bids on 100 tons of road work, and more is to follow. Contractors are resuming work on bridges and culverts, and some of them are ordering out road steel to have it at hand when the engineers permit resumption of slab work. This situation is helping mills, which report shipments the largest so far this year. Plans for the Chicago Carton Co.'s plant, requiring 1000 tons, will be out in about three weeks.

Rails and Track Supplies

Both Chicago rail mills have resumed operations. Based on the 5000 tons of releases made a week ago. The Erie has ordered 24,000 tons, part of which will be rolled by local mills. It is said here that the Erie has made no mention of accessories, but its needs are expected to be announced in the near future. Activity in track supplies is stimulated by an inquiry for 7000 tons of tie plates by the Missouri Pacific and 4000 tons by the Soo Line. Although fresh inquiries for rails are lacking, sellers in this market believe that a turn for the better in railroad business is near at hand.

Wire Products

There is further improvement in demand for wire and wire products from automobile manufacturers, and miscellaneous users are coming into the market a little faster. Most consumers are still very cautious as to the size of tonnages they will take, but at the same time they are keeping a close eye on possible upward changes in prices. Reports from rural areas are better. Steel posts and fencing are beginning to move long after what is usually considered the opening of the season.

Structural Material

Current transactions are very light in all phases of the market. A Chicago contractor is low bidder on the St. Louis Federal Building, which calls for 6500 tons of steel. The contract for the St. Paul Post Office has been closed, the steel, as previously announced, going to the McClintic-Marshall Corp'n. New brewery construction, though much talked about, has not developed, and work of this kind is confined to additions to existing structures.

Plates

The only business of note in this market is an order for 1000 tons of plates to be used for the Denver pipe line. There is some talk that the railroads contemplate equipment pur-

chases, but the general impression is that no action of this kind will be taken until the railroad reorganization plan has been announced at Washington. Activity at railroad shops is increasing, but steel needs remain light. Existing brewery plans, if put into action, would materially help this market.

Bars

Demand for bar mill products continues to gain slowly, with automobile manufacturers the heaviest users. However, it is indicated now that use by miscellaneous consumers is expanding. Some bar mills here are producing at 30 per cent of capacity. A sizable part of the tonnage going into reinforcing bar jobs.

Sheets

Chicago sheet mill operations are making additional gains, and output now stands between 40 and 50 per cent of capacity. The bulk of this business is coming from automobile building centers, but there is also larger distribution by warehouses and miscellaneous users are more active. It is interesting to note that Wisconsin, a center for the manufacture of steel beer kegs, has passed a law prohibiting the use of anything except wood beer kegs.

Warehouse Business

Demand from warehouses is creeping up, and inquiries point to further growth. The two base prices formerly carried for certain widths on No. 10 hot-rolled sheets have been dropped and a single base price of 2.75c. a lb. has been adopted. Also all extras have been changed to conform to mill practice.

Scrap

The Chicago scrap market remains rather quiet except for tonnages moving to docks. Dealers are paying \$6 to \$6.25 a ton, delivered at the dock. Boats are now coming through the Straits, and scrap movement by water from Chicago may be an early development. Most of the scrap recently offered by the railroads has been withdrawn from the market.

China Plans Monopoly of Tungsten

The provincial government of Kiangsi, China, world's principal producer of tungsten and leading Chinese source, is planning again to institute a provincial monopoly of tungsten deposits in that province, according to a radiogram to the Commerce Department's Mineral Division from Commercial Attache Julean Arnold, Shanghai.

World production of tungsten in 1930, latest year for which figures are available, amounted to 16,589 metric tons, of which China produced 9454 metric tons. During that year the United States produced 637 tons and imported 1807 tons, 1196 of which came from China.

Eastern Pennsylvania Steel Output Rises to 12 Per Cent

Miscellaneous Inquiries Show Some Improvement—Oil Industry Showing More Interest in Purchases

PHILADELPHIA, April 11.—While there has been a lag the past week in steel orders, miscellaneous inquiries have shown a slight improvement. Some makers are encouraged over a revival of interest coming from the oil industry, which is feeling the market out for tank steel and pipe tonnage. No sizable railroad buying is in early prospect. Low inventories of the carriers, however, are expected to force them into the market before long and, if the Federal Administration consolidation program is worked out successfully and financing arranged, good-sized purchases by the railroads are expected to develop.

The price structure generally is holding up well, with a firmer tone in raw materials, including scrap and pig iron.

Steel works operations have gained one and one-half points to 12 per cent of capacity as a result of the lighting of two open-hearth furnaces at Pen-coyd, Pa.

Pig Iron

Scattered inquiries are coming to furnaces and have been stimulated by the recent rise in prices for second and third quarter delivery. Sales the past week have involved only small lots. Recent purchases of gray forge iron by a nearby melter are said to have totaled about 10,000 tons, though some estimates are as high as 15,000 tons. March imports of pig iron into the Philadelphia district aggregated 6503 tons, of which 3413 tons was Indian and 3090 tons was Royal Dutch iron. Imports of ferromanganese in March totaled 150 tons from Antwerp, but the shipment is said to have originated in Germany.

Plates, Shapes and Bars

The market generally is dull. Some makers report improvement in orders for plates and shapes, though the upturn is slight. The oil industry is feeling out the market for tank and pipe tonnage. The Virginia Ferry Corp. has awarded a boat, requiring about 600 tons of plate and 400 tons of shapes and bars to Pusey & Jones, Wilmington, Del.

Sheets

Releases by automobile body builders have fallen off somewhat. Inquiries are small. Prices are reported to be well maintained.

Pipe

The Reading Iron Co., Reading, Pa., has announced, effective April 11, reductions in its prices for puddled

wrought iron pipe, amounting in some sizes to as much as \$20 a ton. The average reduction for all sizes is over \$10 a ton, the reductions applying to standard, heavy and double heavy wrought iron pipe.

Imports

The following iron and steel imports were received here last week: 4200 tons of manganese ore from Cuba, 4172 tons of pig iron from British India, 41 tons of steel bands, 25 tons of steel flats and 20 tons of structural shapes from Belgium.

Scrap

The tone of the market remains firm, but mills are buying cautiously. Any substantial upturn in purchases is expected to develop higher prices. Some dealers are showing reluctance to take tonnages at present levels. A cargo of 4000 tons of No. 1 heavy melting steel will be loaded here next Monday for shipment to Japan.

Two Buffalo Bridges Will Take 13,000 Tons of Steel

BUFFALO, April 11.—Pig iron sales in the past week are estimated to have been more than 2000 tons, mostly in scattered lots, although 750 tons of foundry iron for a New York State melter was placed. Operations of foundries remain about the same, with a little more activity among the gray iron foundries.

Steel

Bids will be taken after April 14 on one of the largest steel construction projects to develop in this territory in many years. Two bridges to be built across the Niagara River from Buffalo and Tonawanda to Grand Island; they will require 11,500 tons of structural steel and 1500 tons of reinforcing bars. A loan of \$2,800,000 has been authorized for this project by the Reconstruction Finance Corp. Reappointment of members of the Grand Island Bridge Commission comes before Governor Lehman on April 14, at which time it will be determined whether the commission or the State of New York will advertise for bids. Grand Island, approximately 20 miles long, lies in the Niagara River wholly in American waters and about half a mile from the Buffalo and Tonawanda mainland. It is now accessible only by ferry, and promoters of the bridges believe that completion of their project will open up a large

industrial and residential development.

The Lackawanna plant of Bethlehem Steel is operating three open-hearths and Republic Steel has increased from one open-hearth to two. Wickwire Spencer continues to operate one. An award of 200 tons of fabricated structural steel was made to a Buffalo fabricator for a new brewery. Additional construction at the State prison at Danemora, N. Y., will require several hundred tons of reinforcing bars and some structural steel. Plans are now being studied and figured.

Scrap

With very little buying going on, the market continues strong. It is understood that on a recent sale of machine shop turnings from a distant point to Niagara Falls, \$7 was paid. Dealers say that no tonnage can be purchased at present quoted prices.

St. Louis Pig Iron Market Firmer; Scrap Strengthens

ST. LOUIS, April 11.—The pig iron market has firmed up considerably, and 50c. a ton more is being asked, although published quotations are unchanged. The opportunity for bargains seems to have passed. With the firmer tone has come a disposition to further hold off buying, although it is expected that buying will begin shortly. Inquiries for second quarter shipment, although not beyond that, are being issued by a number of melters in varied lines. The agricultural industry is decidedly more hopeful. Jobbing foundries are busier than for some time.

Steel

Word comes from Budget Director Douglas in Washington that the construction contract for the St. Louis Federal Building will be awarded as quickly as possible to the N. P. Severin Construction Co., Chicago, the low bidder. The building will require 6500 tons of structural steel and 900 tons of reinforcing bars.

Open-hearth furnace operations slipped back this week to about 15 per cent of capacity.

All inquiries for merchant pipe await the action of the States of Texas and Oklahoma in the matter of prorata of production, which has been pending for some time.

The State of Missouri will be in the market shortly for 1600 tons of structural steel for highway bridges.

Scrap

An East Side melter bought a round tonnage of heavy melting steel the past week at current quotations. Dealers could have sold more, but they believe that higher prices will prevail. Miscellaneous standard-section rails are 50c. a ton higher, and railroad springs are up 25c. a ton.

Cleveland Steel Business Is Aided by Automotive Orders

Sheets and Strip Placed by Chevrolet and Ford—Erie Releases 24,549 Tons of Rails—Pig Iron Up

CLEVELAND, April 11.—Stimulated by an increased demand from the automotive industry, business in finished steel made further gains during the week. In addition, the Erie Railroad placed 24,549 tons of rails for its 1933 requirements and issued releases for the greater part of this tonnage for deliveries in monthly installments during April to July, inclusive, thus permitting rail mills to start immediate rolling on these orders.

Ingot output in Cleveland is unchanged at 32 per cent of capacity.

Enlarged motor car production schedules, particularly by the Chevrolet and Ford companies, has led to substantial releases in sheets and strip steel and has enabled some of the Ohio finishing mills to increase operations materially this week. Some business in hot-rolled strip has come from mills making cold-rolled strip, and the demand from parts makers, including orders for bars from forge shops doing automotive work, has gained. Miscellaneous orders for steel from industries outside of the automotive field continue to show some gain, although orders are still for small lots.

The Erie Railroad rail order was divided as follows: Carnegie Steel Co., 16,049 tons; Illinois Steel Co., 4000 tons; Inland Steel Co., 2000 tons; Bethlehem Steel Co., 2000 tons.

Steel prices generally are steady. A 50c. a ton price advance on pig iron has been made by leading Lake producers.

Pig Iron

An advance of 50c. a ton from the minimum that has prevailed for some time on foundry and malleable iron for outside delivery has been made by two leading Lake furnace interests, which are now quoting a minimum of \$14 for these grades. The price for Cleveland delivery is unchanged at \$15, furnace. The firmer tone of the market appears to be a reflection of the recently developed firmness in scrap prices in some districts. New demand is not active and is confined to small lots. One producer sold 1500 tons during the week. Shipments so far this month are about 50 per cent ahead of March when they declined sharply because of the banking situation.

Iron Ore

There is still a lack of interest in the market, and it may be several weeks before 1933 prices are established. Consumers generally have not yet prepared their shipping schedules.

Shipments from Lake Erie docks in March were 35,083 tons, against 49,544 tons during the same month last year. The dock balance April 1, was 5,070,768 tons, against 5,759,363 tons on the same date a year ago.

Strip Steel

Releases for good-sized lots of both hot and cold-rolled strip for quick delivery were made during the week by some of the General Motors plants. Orders from other consumers in the automotive field also show a gain. Demand in this immediate territory is slack. Hot-rolled strip is firm at 1.45c., Pittsburgh. Cold-rolled material is quoted at 1.80c., Cleveland, to large consumers and up to 2c. for smaller buyers.

Bars, Plates and Shapes

The Mill Creek interceptor sewer, Cincinnati, has been awarded to Winston Brothers, contractors, following disposal of litigation. This will require 500 tons of steel piling and 400 tons of reinforcing bars. Public work generally is being held up. The

Cincinnati Pig Iron Sales Decline

CINCINNATI, April 11.—Demand for pig iron declined the past week, following an advance in Northern prices and reports of an early rise in Southern quotations. Consumers are covered beyond immediate needs, although inventories are not of great size. Shipments of pig iron improved the past week, but bookings were less than 500 tons. Interest in Southern iron was more apparent in the market, and for the first time in more than a year, Southern furnaces received almost half of the tonnage, although orders were all for small lots.

Steel

Expansion of culvert and automotive demand the past week sustained sheet buying at the level of the previous week, despite easing of demand in other industries. Mills in this territory greatly benefited by the rush of consumers to cover before the effective date of second quarter prices. Production at one plant has been stepped up to the highest level in some time.

Scrap

Recent reported sales of 200,000 tons of railroad scrap will have little effect upon the local market since none of the material is for shipment into this area. Sales of scrap are small

Ohio road building program for 1933 will not be decided until after the reconvening of the Legislature May 15. There is still a demand for small angles for beer cases. Demand for plates from boiler shops has improved. There is also some gain in the demand for bars, both from automotive and miscellaneous sources. Prices are firm at 1.65c., Cleveland, for bars, and 1.60c., Pittsburgh, for plates and shapes.

Sheets

New demand from the automotive industry shows a fair increase. Orders covering their requirements for 30 days were placed by some of the motor car manufacturers during the week. Miscellaneous demand has improved for hot-rolled, enameling and galvanized sheets. Prices are steady. Galvanized sheets have not been advanced above the 2.60c. price.

Scrap

A Cleveland steel plant has released a fair tonnage of open-hearth and blast furnace scrap, and this has resulted in some activity among dealers who are covering against these outstanding orders. In spite of reported strength in the Pittsburgh and Youngstown districts, prices here are unchanged except on compressed sheet steel and machine shop turnings, which have advanced. Dealers are still able to buy No. 1 heavy melting steel at \$7.

and infrequent, since trading prices are too low to permit dealers' bids to rise sufficiently high to attract scrap into this market. The Southern Railway, the Norfolk & Western and the Chesapeake & Ohio are offering lists, bids to close this week.

Pacific Coast Projects Mostly Public Work

SAN FRANCISCO, April 10.—Specifications have been completed at Torrance, Cal., for a new municipal water system which will include a 250,000-gal. tank and 2650 tons of cast iron pipe. Victorville, Cal., will take bids soon on a water system that will require 345 tons of 4 and 6-in. cast iron pipe.

During the week projects involving major tonnages were carried forward with awards of 2070 tons of structural steel. The Silver Lake Avenue grade separation, requiring 420 tons, went to the Consolidated Steel Corp. New structural inquiries total 1410 tons. At San Francisco bids will be taken April 15 on the Bohemian Club, which will require 900 to 1000 tons of structural steel. Reinforcing bar awards were only for 300 tons, with inquiries totaling 900 tons being reported. Bids will be taken April 18 on 500 tons of bars for the Pine Canyon Dam near Pasadena, Cal. Bids are to be received until April 18 for the Second Narrows Bridge at Vancouver, B. C.

New York Steel Orders Show a Moderate Gain

Tin Plate Specifications Help Week's Bookings—Triborough Bridge Work to Go Ahead

NEW YORK, April 11.—A mild increase in steel orders during the past week, in which tin plate made the best showing, has given some encouragement to the New York steel trade, which has had greatly restricted business since the bank closings. A few companies had the best week since the banks reopened. Next to tin plate, sheets were in the best demand.

Prospective business includes two water pipe lines in northern New York, one in Saratoga Springs and the other in Batavia; a sub post office for New York City, requiring 3700 tons of steel, on which the D. M. W. Construction Co., Brooklyn, is low bidder on the general contract, and the release of steel for the Triborough bridge and tunnel, completion of which will proceed under an authority created by the New York State Legislature.

Steel companies are looking forward hopefully to the proposed \$3,000,000,000 building program of the Roosevelt Administration and to the completion of railroad reorganization plans. If the railroad problem is solved within the near future, it will make a material difference in steel orders, it is believed, as the railroads are known to have an accumulation of requirements, particularly in rails, track fastenings and car repair material.

The price situation is unchanged. Plates continue to be the weakest spot. Sharp price competition also prevails in reinforcing bars.

Pig Iron

Bookings in the past week, at 2500 tons, equaled those in the preceding week and compare with 4500 tons a fortnight ago. Recent contracts have been chiefly for spot and second quarter shipment, with a few sales reported for delivery into third quarter. Part of last week's bookings represented resale iron. General inquiry has thinned out. Foundries are generally inactive, and only in scattered cases have melts been stepped up to any extent. At the prevailing reduced operating rate, consumers are fairly well covered for their actual requirements for at least a month ahead, and any further swelling in demand will probably await the impetus of general expansion in melt. Price firmness is still evident. Eastern Pennsylvania iron is steady at \$13.50, furnace, for the base grade. Silicon differentials of 25c. a ton have been instituted on Buffalo brands for delivery in that district, but premiums

have not yet been made applicable to Eastern shipments. Although sellers of foreign iron are reported to hold higher price views, there is no evidence of any upward revisions in quotations on import brands.

Reinforcing Bars

The Reconstruction Finance Corp. has approved a loan for constructing two bridges that will connect Grand Island with Albany and Niagara Falls, N. Y. Bar requirements for this project are estimated at 1500 tons. Reconstruction of the St.

George's ferry viaduct on Staten Island will require 150 tons, and a sewer project in Brooklyn will take 366 tons. Highway work in New York and New Jersey accounted for the bulk of last week's awards. Prices still lack stability. The 1.40c., Pittsburgh base has been subject to frequent concessions on sizable lots.

Scrap

A shipload of No. 1 steel has been sold for delivery to Japan. This material is being purchased at \$6 a ton, f.o.b. cars on dock, for direct loading onto steamer. The barge price for No. 1 steel is unchanged at \$5. Foreign buyers are reported to be seeking further tonnages of the heavy melting grades, but as yet have not conceded to the demands of sellers for higher prices. Domestic consumers are sparing in their demands, and shipments to Eastern mills are irregular. Prices for cast grades and specialty grades are firm.

Valley Steel Industry Showing Signs of Gradual Recovery

YOUNGSTOWN, April 11.—The Valley steel industry is gradually recovering from the effects of the banking holiday. One small company reports that its tonnage is now comparable with the February average. The larger interests are reacting more slowly to improvement, but orders for practically all finished products are running ahead of those of March. The volume of orders from the automobile industry is still disappointing, but demand for sheets for other purposes is considerably improved, while open weather is bringing increased orders for wire products, reinforcing bars and galvanized roofing stock. The results of the recent drastic reduction in pipe prices are not yet apparent, but oil country goods are quiet because of the uncertainty in that industry, and sizeable line pipe projects are still lacking.

Steel ingot production in the Valleys is now averaging about 18 per cent of capacity, as compared with a low of about 12 per cent in mid-March. The schedules of finishing mills are still intermittent, but tin mills in the district are averaging well over 50 per cent, while sheet producers have stepped up production to 20 per cent. Bar units are engaged at a lower rate and strip mills are adhering to their usual policy of running every other week.

Valley and northern Ohio mills have derived some additional tonnage from the brewing industry, principally in the form of hoops and tin plate for bottle caps. One hoop mill

in the district has been running rather steadily in the last month and others are actively soliciting the barrel making trade from which they took business in the past. No reports are heard of steel for tanks in this district.

Finished steel prices, with the possible exception of cold-rolled strip, are more stable than they have been at any time this year. Consumers of steel are not averse to covering their requirements for comparatively long periods, but mills are avoiding contracts of more than three months' duration whenever possible. Any pronounced improvement in demand would undoubtedly lead mills to advance prices for the third quarter. In the meantime, they are content in their efforts to provide a firm basis from which to raise selling prices, now many dollars below the cost of production in this district. The semi-finished steel market is unusually firm, with \$26, Youngstown, the prevailing quotation on billets, slabs and sheet bars.

The raw materials markets are definitely stronger and talk is heard of an advance in pig iron prices. Nevertheless, demand in the district has not improved materially, and any increase undertaken will probably take the form of a strengthening of prevailing quotations. The scrap market reflects pronounced strength in the Pittsburgh district and No. 1 heavy melting steel is no longer available at \$9.50. No recent sales are reported which would bring quoted prices to a higher level.

Fabricated Structural Steel

Lettings Decline—New Projects in Good Volume

AWARDS of 7000 tons are mostly for public work and compare with 20,300 tons a week ago. The largest letting, 1000 tons, is for the St. George viaduct at Staten Island, N. Y. New projects of 17,200 tons are considerably larger than those of a week ago and are swelled by a single inquiry of 11,500 tons for bridges over the Niagara River to Grand Island. Awards follow:

NORTH ATLANTIC STATES

Buffalo, 230 tons, storage building, Gerhard Lang Brewing Co., to R. S. McMannus Steel Construction Co., Inc.

Scarsdale, N. Y., 290 tons, high school and grade school, to Belmont Iron Works.

Perth Amboy, N. J., 130 tons, dairy plant, to Bethlehem Fabricators, Inc.

New York, 1000 tons, St. George viaduct, Staten Island, to Phoenix Bridge Co.

Brooklyn, 120 tons, Church of our Lady of Refuge, to Bethlehem Fabricators, Inc.

SOUTH AND SOUTHWEST

Taft, Okla., 300 tons, reformatory, to Capitol Steel & Iron Co.

El Reno, Okla., 300 tons, mess hall and school building, to Capitol Steel Co.

Tarrant County, Tex., 150 tons, highway bridge, to North Texas Iron & Steel Co.

St. Tammany Parish, La., tonnage not stated, movable bridge, to Wisconsin Bridge & Iron Co.

State of Mississippi, 462 tons, Monroe county bridge girders, to Virginia Bridge & Iron Co.

Bernalillo County, N. M., 220 tons, State paving structure, to an unnamed bidder.

CENTRAL STATES

Chicago & North Western Railway, 210 tons, beam bridges in Michigan, to American Bridge Co.

Sedgewick County, Kan., 360 tons, highway bridge, to Kansas City Structural Steel Co.

Chicago, 225 tons, Hollywood Theatre for Century of Progress, to Gage Structural Steel Co.

Chicago, 160 tons, Avenue of Flags for Century of Progress, to Gage Structural Steel Co.

Gentry County, Mo., 140 tons, highway bridge, to St. Joseph Structural Steel Co.; previously reported to Pittsburgh-Des Moines Steel Co.

State of Missouri, 550 tons, highway bridges, to Stupp Brothers Bridge & Iron Works.

State of Nebraska, 120 tons, bridges, to Omaha Steel Works.

WESTERN STATES

Colorado Springs, Colo., 125 tons, Printers' Home, to E. Burkhardt & Sons.

Twin Bridges, Mont., 125 tons, bridge over Jefferson River, to Isaacson Iron Works.

Los Angeles, 420 tons, Silver Lake avenue grade separation, to Consolidated Steel Corp.

Los Angeles, 455 tons, Sunset Boulevard bridge and Temple Street bridge, to Consolidated Steel Corp.

Santa Ana, Cal., 175 tons, department store, to Minneapolis-Moline Power Implement Co.

Whatcom County, Wash., 258 tons, bridge over Baker River, to an unnamed bidder.

Seattle, 125 tons, river work by United States Engineers, to an unnamed bidder.

Metaline Falls, Wash., 130 tons, highway bridge, to Virginia Bridge & Iron Co.

Ventura, Cal., 100 tons, post office, to Consolidated Steel Corp.

Nome, Alaska, 175 tons, Government project, to Pacific Coast Steel Corp.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Danmora, N. Y., 1000 tons, building for Clinton Prison.

Unadilla, N. Y., 235 tons, grade crossing elimination for Delaware & Hudson Railroad.

Baltimore, 150 tons, alteration to garage for Rice Bakery Co.

Buffalo, 11,500 tons, bridges over Niagara River to Grand Island.

SOUTHWEST

Phoenix, Ariz., 1500 tons, post office, Great Lakes Construction Co. low bidder.

El Reno, Okla., 300 tons, cell block and utility buildings for Southwestern Reformatory; Worsham Brothers, Knoxville, Tenn., low bidders.

CENTRAL STATES

Detroit, 100 tons, bridge for Pennsylvania Railroad; American Bridge Co. low bidder.

State of Illinois, 278 tons, highway bridge in Alexandria County; bids to be opened April 19.

St. Louis, 6500 tons, Federal building; N. P. Severin & Co., low bidders.

State of Missouri, 1500 tons, highway bridges.

Cincinnati, 500 tons sheet piling for Mill Creek interceptor sewer.

WESTERN STATES

San Francisco, 260 tons, Raish apartment building, bids soon.

San Francisco, 1000 tons, Bohemian Club, bids April 15.

Goshen Junction, Cal., 150 tons, Southern Pacific subway, bids under advisement.

FABRICATED PLATE

AWARDS

Brooklyn, 150 tons, syrup tanks for New York Dock Co., to Pittsburgh-Des Moines Structural Steel Co.

Boulder, Nev., 475 tons, cement storage tanks for Six Companies, Inc., to Consolidated Steel Corp.

Los Angeles, 100 tons, 16 tanks, to Western Pipe & Steel Co.

Seattle, 250 tons, standpipe, to Puget Sound Machinery Depot.

Cast Iron Pipe

Warren Foundry & Pipe Corp. is low bidder on 450 tons required by Milton, Mass.

Manchester, N. H., has awarded 400 tons of 4- to 12-in. to the United States Pipe & Foundry Co.

Hartford, Conn., has awarded 150 tons of 12-in. to Warren Foundry & Pipe Corp.

Marblehead, Mass., has placed 150 tons with Warren Foundry & Pipe Corp.

Leominster, Mass., has under advisement bids on 10,680 ft. of 8-in. Class 150, 2500 ft. of 10-in. and 9760 ft. of 12-in.

Woonsocket, R. I., closed bids April 12 for its yearly pipe requirements. No actual tonnage was specified.

Appleton, Wis., has awarded 165 tons to United States Pipe & Foundry Co.

Chicago has awarded about 10,000 tons of 30- to 48-in.; 2500 tons to James B. Clow & Sons, and 7500 tons to United States Pipe & Foundry Co.

New Orleans let contract to American Cast Iron Pipe Co. for about 100 tons for water system.

Victorville, Cal., will take bids soon on 347 tons.

San Francisco has awarded 410 tons for the County Jail to Frederick W. Snook Co.

Everett, Wash., the Pacific Water Works Supply Co. was awarded the contract for 1800 tons instead of 1275 tons as originally reported.

Victorville, Cal., will require about 37,000 lin. ft. of 4- to 6-in. for proposed water system. Bond issue of \$50,000 has been voted for work. Charles L. Foulke, 455 Fourth Street, San Bernardino, Cal., is consulting engineer.

The Dalles, Ore., will purchase about 3000 ft., 6- to 8-in. for municipal water system extensions; John Chambers, superintendent of waterworks, in charge.

Pipe Lines

Texas Corp., Houston, Tex., has approved plans for construction of 4-in. steel pipe line from oil field district at Opelousas, La., to Livonia, La., and vicinity, about 19 miles.

United States Engineering Office, Kansas City, Mo., asks bids until April 17 for 10 lengths of welded steel pipe (Circular 597).

Guymon, Okla., will ask bids before close of month for about 13 miles of steel pipe for municipal gas system. Fund of \$50,000 is being arranged for work, including gas distributing plant.

Consolidated Gas, Electric Light & Power Co., Baltimore, is considering early purchase of over 500 tons of 6-in. steel pipe for gas mains.

J. A. Davis, 4215 South Carrollton Street, New Orleans, is interested in installation of steel pipe line for oil service near city, and is considering early purchase of 90,000 to 100,000 ft. of 8-in. diameter pipe.

Reinforcing Steel

Awards 650 Tons—New Projects, 3600 Tons

State of New York, 165 tons, highway construction, Yonkers-White Plains, to Kalman Steel Corp.

State of New Jersey, 175 tons, highway construction, route 29, section 3A, to Truscon Steel Co.; S. J. Groves & Son, general contractors.

San Quentin, Cal., 181 tons, State prison, to Pacific Coast Steel Corp.

Ventura County, Cal., 122 tons, State paving, to Pacific Coast Steel Corp.

NEW REINFORCING BAR PROJECTS

Brooklyn, 866 tons, sewer project on Avenue L.

Staten Island, N. Y., 150 tons, reconstruction of St. George's ferry viaduct; bids in.

Buffalo, 1500 tons, bridges over Niagara River to Grand Island.

Pittsburgh, 160 tons, section of Mount Washington roadway; Navarro Contracting Co., general contractor.

Cincinnati, 400 tons, Mill Creek interceptor sewer.

State of Illinois, 100 tons, road work.

St. Louis, 900 tons, Federal building, N. P. Severin Construction Co., general contractor.

San Jose, Cal., 100 tons, State armory; bids April 18.

San Jose, Cal., 100 tons, city bridge; bids soon.

Pasadena, Cal., 500 tons, Pine Canyon dam; bids April 18.

Denver, 200 tons, for Boulder Dam; bids under advisement.

Non-Ferrous Prices Swing Upward on Mixed Factors

Copper Up on Curtailment Prospects; Tin, Lead Backed by Good Demand; Zinc Gains on Tight Ore Situation

NEW YORK, April 11.—Prospects of a complete suspension of domestic copper production and further talk of inflation have injected vigor into the domestic market. Though no definite plans have been announced, leading interests suggest the probability that current discussions will likely lead to a complete shutdown on May 1, extending for about six months. In the event that the plans crystallize, the action of American producers, it is pointed out, would establish a precedent worthy of consideration by foreign operators, who might be expected subsequently to effect curtailment on a more moderate scale. Definite announcements relating to shutdowns are expected from some American producers before May 1. Electrolytic copper, as a consequence of these prospects, has risen $\frac{1}{2}$ c. a lb. during the week to 5.37 $\frac{1}{2}$ c., Connecticut basis, with some metal held at 5.50c. Moderate business has been done at both levels. Domestic

consumers, in view of the break in prices in March following a quick jump to 5.75c., are now wary about entering definite commitments, evidently preferring to await a more definite turn in events. It is the opinion of a leading factor here that, should a general shutdown materialize, both producers' and custom smelters' offerings would be posted probably at a starting point of 6c., Connecticut basis.

Dealings in foreign markets were brisk toward the close of last week. Continental quotations rose sharply from 4.95c. early in the week to the current range of 5.37 $\frac{1}{2}$ c. to 5.50c., c.i.f. usual ports. Demand was particularly active in the United Kingdom, following a quiet spell.

Tin

Spot Straits tin has advanced 60 points in the past week to 25.50c. a lb., New York, nearly matching the

previous week's gain. Most of the last week's advance was backed by a good demand for nearby metal, strength in the London market and the continued tight position of New York stocks. Buying interest has been well spread out, with calls particularly urgent from shops engaged in beer pipe manufacture. Future tin is somewhat neglected. Strong tendencies in London today were offset here by weak sterling. London quotations averaged more than £4 higher for the week, with today's market £156 7s. 6d. a ton for spot standard, £157 for future standard, and £162 7s. 6d. for spot Straits. The Singapore market surged ahead £5 15s. during the week to today's level of £163 15s. United Kingdom warehouse stocks continued their gradual decrease, dropping 215 tons last week to 27,451 tons. Straits shipments up to and including April 8 aggregated 1403 tons.

Lead

The leading Eastern and Midwestern factors today increased their contracting bases \$5 a ton to 3.25c. a lb., New York, and 3.12 $\frac{1}{2}$ c., St. Louis. These advances were predicated chiefly upon a strong demand for both prompt and May metal. Bookings on Saturday and Monday showed a notable increase in demand from lead pipe and sheet manufacturers and from corrodors. Inquiry was actively renewed today and promises at least a temporary buying movement. The underlying strength of the market is abetted further by the adjusting influence of recent curtailment, which is expected soon to effect a definite balance between production and consumption.

Zinc

While open demand for prime Western has not improved, bookings in the past week are understood to have been the largest in many weeks. A \$2 advance yesterday, however, to 3.10c. a lb., East St. Louis, or 3.47c., New York, was sponsored chiefly by continued strength in the Joplin ore fields. Ore production last week amounted to only 1500 tons, in contrast with 4100 tons in the preceding period. Smelters were able to purchase only 980 tons of ore at \$17 for flotation and \$18 for mill grades.

Master Metals, Inc., has been formed to take over the lead alloys department of the Master Builders Co., 6713 Morgan Avenue, S. E., Cleveland. The National Lead Co. and the Master Builders Co. will be stockholders in the new company, the National company holding control. W. C. Beachorman is president of the new company, S. W. Flesheim, vice-president and manager, C. C. Foerstner, vice-president, Charles Simon, treasurer, and H. W. Dickerson, secretary.

The Week's Prices. Cents Per Pound for Early Delivery

	April 5	April 6	April 7	April 8	April 10	April 11
Electrolytic copper, N. Y.*	4.75	4.75	5.00	5.00	5.00	5.12 $\frac{1}{2}$
Lake copper, New York	5.00	5.00	5.25	5.25	5.25	5.50
Straits tin, Spot, N. Y.	25.00	25.15	25.25	25.50	25.50	25.50
Zinc, East St. Louis	3.00	3.00	3.00	3.00	3.10	3.10
Zinc, New York	3.37	3.37	3.37	3.37	3.47	3.47
Lead, St. Louis	2.87 $\frac{1}{2}$	2.87 $\frac{1}{2}$	2.87 $\frac{1}{2}$	2.87 $\frac{1}{2}$	2.87 $\frac{1}{2}$	3.12 $\frac{1}{2}$
Lead, New York	3.00	3.00	3.00	3.00	3.00	3.25

*Refinery quotations price $\frac{1}{4}$ c. higher delivered in Connecticut.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 5.95c. a lb., New York.
Brass ingots, 85-5-5-5, 5.50c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	27.00c. to 28.00c.
Tin, bar	29.00c. to 31.00c.
Copper, Lake	7.00c. to 8.00c.
Copper, electrolytic	6.75c. to 7.75c.
Copper, casting	6.50c. to 7.50c.
*Copper sheets, hot-rolled	13.87 $\frac{1}{2}$ c.
*High brass sheets	11.25c.
*Seamless brass tubes	13.50c.
*Seamless copper tubes	12.62 $\frac{1}{2}$ c.
*Brass rods	8.75c.
Zinc, slabs	4.37 $\frac{1}{2}$ c. to 4.87 $\frac{1}{2}$ c.
Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Lead, American pig	3.75c. to 4.25c.
Lead, bar	5.25c. to 6.25c.
Lead, sheets	7.00c.
Antimony, Asiatic	8.00c. to 9.00c.
Alum., virgin, 99 per cent plus	23.30c.
Alum. No. 1 for remelting, 98 to 99 per cent	16.00c.
Solder, $\frac{1}{2}$ and $\frac{1}{4}$	15.50c. to 16.50c.
Babbitt metal commercial grade	21.00c. to 32.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	29.50c.
Tin, bar	31.50c.

Copper, Lake	6.00c.
Copper, electrolytic	6.00c.
Copper, casting	5.75c.
Zinc, slab	4.25c. to 4.50c.
Lead, American pig	4.00c. to 4.50c.
Lead, bar	7.50c.
Antimony, Asiatic	8.50c.
Babbitt metal, medium grade	16.50c.
Babbitt metal, high grade	33.25c.
Solder, $\frac{1}{2}$ and $\frac{1}{4}$	18.00c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	3.875c.	4.375c.
Copper, hvy. and wire	3.75c.	4.25c.
Copper, light and bottoms	2.875c.	3.625c.
Brass, heavy	1.75c.	2.375c.
Brass, light	1.375c.	1.75c.
Hvy. machine composition	2.75c.	3.125c.
No. 1 yel. brass turnings	2.125c.	2.50c.
No. 1 red brass or compos. turnings	2.375c.	2.75c.
Lead, heavy	2.125c.	2.50c.
Zinc	1.25c.	1.625c.
Cast aluminum	3.75c.	5.00c.
Sheet aluminum	8.50c.	10.00c.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel		Base per Lb.
F.o.b. Pittsburgh mill	.....	1.60c.
F.o.b. Chicago	.....	1.70c.
Del'd Philadelphia	.....	1.91c.
Del'd New York	.....	1.95c.
Del'd Detroit	.....	1.80c.
F.o.b. Cleveland	.....	1.85c.
F.o.b. Lackawanna	.....	1.70c.
F.o.b. Birmingham	.....	1.75c.
C.I.F. Pacific ports	.....	2.10c.

Billet Steel Reinforcing (as quoted by distributors)

F.o.b. P'gh mills, 40, 50, 60-ft.	.....	1.40c.
F.o.b. Birmingham, mill lengths	.....	1.65c.
F.o.b. Cleveland	.....	1.40c.

Rail Steel

F.o.b. mills, east of Chicago dist.	.....	1.30c.
F.o.b. Chicago Heights mills	.....	1.50c.

Iron

Common iron,	Chicago	1.60c.
Refined iron, f.o.b. P'gh mills	.....	2.75c.
Common iron, del'd Philadelphia	.....	1.84c.
Common iron, del'd New York	.....	1.90c.

Tank Plates

Base per Lb.	
F.o.b. Pittsburgh mill	..... 1.60c.
F.o.b. Chicago	..... 1.70c.
F.o.b. Birmingham	..... 1.75c.
Del'd Cleveland	..... 1.8035c.
Del'd Philadelphia	..... 1.4935c. to 1.5935c.
F.o.b. Coatesville	..... 1.40c. to 1.50c.
F.o.b. Sparrows Point	..... 1.40c. to 1.50c.
Del'd New York	..... 1.598c. to 1.698c.
C.I.F. Pacific ports	..... 2.00c.
Wrought iron plates, f.o.b. P'gh	..... 3.00c.

Structural Shapes

Base per Lb.	
F.o.b. Pittsburgh mill	..... 1.60c.
F.o.b. Chicago	..... 1.70c.
F.o.b. Birmingham	..... 1.75c.
F.o.b. Lackawanna	..... 1.70c.
F.o.b. Bethlehem	..... 1.70c.
Del'd Cleveland	..... 1.8035c.
Del'd Philadelphia	..... 1.4935c.
Del'd New York	..... 1.598c. to 1.698c.
C.I.F. Pacific ports (standard)	..... 2.10c.
C.I.F. Pacific ports (wide flange)	..... 2.20c.

Steel Sheet Piling

Base per Lb.	
F.o.b. Pittsburgh	..... 1.90c.
F.o.b. Chicago mill	..... 2.05c.
F.o.b. Buffalo	..... 2.00c.

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago, Buffalo, Massillon or Canton.)

Alloy Quantity Bar Base, 2.45c. to 2.65c. per Lb.	
S.A.E. Series	Alloy
Numbers	per 100 lb.
3000 (1/4% Nickel)	..... 80.25
2100 (1/2% Nickel)	..... 0.55
2300 (3/4% Nickel)	..... 1.50
3200 (5% Nickel)	..... 2.25
3100 Nickel Chromium	..... 0.55
3200 Nickel Chromium	..... 1.35
3300 Nickel Chromium	..... 3.80
3400 Nickel Chromium	..... 3.20
4100 Chromium Molybdenum (0.25 to 0.25 Molybdenum)	..... 0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	..... 0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum)	..... 1.50
5100 Chromium Steel (0.60 to 0.90 Chromium)	..... 1.05
5100 Chromium Steel (0.80 to 1.10 Chromium)	..... 0.35
5100 Chromium Spring Steel	..... 0.45
5100 Chromium Vanadium Bar	..... 1.20
4100 Chromium Vanadium Spring Steel	..... 0.95
9250 Silicon Manganese Spring Steel (flat)	..... 0.25
Round and Square	..... 0.50
Chromium Nickel Vanadium	..... 1.50
Carbon Vanadium	..... 0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is 3/4c. a lb. higher for standard classification for cold-finish alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 lb. or over carry the billet price. Slabs with sectional area of less than 16 lb. or less than 2 1/2 in. thick, regardless of sectional area, take the bar price.

Cold Finished Bars*

Bars, f.o.b. Pittsburgh Mill	.....	1.70c.
Bars, f.o.b. Chicago	.....	1.75c.
Bars, Cleveland	.....	1.75c.
Bars, Buffalo	.....	1.75c.
Bars, Detroit	.....	1.75c.
Bars, eastern Michigan	.....	1.95c.
Shafting, ground, f.o.b. mill	.....	1 1/4 in. 3.00c.
	1-3/16 to 1 1/2 in.	2.50c.
	1-9/16 to 1 3/4 in.	2.35c.
	1-15/16 to 2 1/4 in.	2.30c.
	2-15/16 to 6 in.	2.05c.

* In quantities of 10,000 to 19,999 lb.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot-Rolled

No. 10, f.o.b. Pittsburgh	.....	1.40c.
No. 10, f.o.b. Chicago mill	.....	1.50c.
No. 10, del'd Philadelphia	.....	1.71c.
No. 10, f.o.b. Birmingham	.....	1.55c.
No. 10, c.I.F. Pacific Coast ports	.....	2.02 1/2c.

Hot-Rolled Annealed

No. 10, Pittsburgh	.....	1.55c.
No. 10, Chicago mills	.....	1.65c.
No. 10, Birmingham	.....	1.70c.
No. 10, Pacific Coast ports	.....	2.17 1/2c.
No. 10, wrought iron, Pittsburgh	.....	3.60c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	.....	2.00c.
No. 24, f.o.b. Chicago mills	.....	2.10c.
No. 24, del'd Philadelphia	.....	2.31c.
No. 24, f.o.b. Birmingham	.....	2.15c.
No. 24, c.I.F. Pacific Coast ports	.....	2.65c.
No. 24, wrought iron, Pittsburgh	.....	4.30c.

Heavy Cold-Rolled

No. 10, gauge, f.o.b. Pittsburgh	.....	1.90c.
No. 10, gauge, f.o.b. Chicago mills	.....	2.00c.
No. 10, gauge, del'd Philadelphia	.....	2.21c.
No. 10, gauge, del'd Pacific Coast ports	.....	2.52 1/2c.

Light Cold-Rolled

No. 20, gauge, f.o.b. Pittsburgh	.....	2.30c.
No. 20, gauge, f.o.b. Chicago mills	.....	2.40c.
No. 20, gauge, del'd Philadelphia	.....	2.61c.
No. 20, gauge, del'd Pacific Coast ports	.....	2.92c.

Note: Automobile body stock and steel furniture sheets to be quoted henceforth on cold-rolled sheet base prices, with extras for drawing quality.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	.....	2.60c.
No. 24, f.o.b. Chicago mills	.....	2.70c.
No. 24, del'd Philadelphia	.....	2.91c.
No. 24, f.o.b. Birmingham	.....	2.75c.
No. 24, c.I.F. Pacific Coast ports	.....	3.25c.
No. 24, wrought iron, Pittsburgh	.....	4.95c.

Long Ternes

No. 24, unassorted, 8-lb. coating, f.o.b. Pittsburgh	2.75c.
--	-------	--------

Vitreous Enameling Stock

No. 10, f.o.b. Pittsburgh	.....	2.40c. to 2.50c.
No. 20, f.o.b. Pittsburgh	.....	2.90c. to 3.00c.

Tin Mill Black Plate

No. 23, f.o.b. Pittsburgh	.....	2.30c.
No. 23, Chicago mill	.....	2.40c.

Tin Plate

Base per Box	
Standard cokes, f.o.b. P'gh district mill	..... \$4.25
Standard cokes, f.o.b. Gary	..... 4.35

Terne Plate

(F.o.b. Morgantown or Pittsburgh) (Per Package, 20 x 28 in.)	
8-lb. coating I.C.	..... \$8.70
15-lb. coating I.C.	..... 11.00
20-lb. coating I.C.	..... 11.90
25-lb. coating I.C.	..... 13.00
30-lb. coating I.C.	..... 13.80
40-lb. coating I.C.	..... 15.30

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in.

Base per Lb.	
All widths up to 24 in., Pittsburgh	..... 1.45c.
All widths up to 24 in., Chicago	..... 1.55c.
Cooperage stock, P'gh	..... 1.55c. to 1.60c.
Cooperage stock, Chicago	..... 1.65c. to 1.70c.

Cold-Rolled Strips

F.o.b. Pittsburgh	.....	1.80c. to 2.00c.
F.o.b. Cleveland	.....	1.80c. to 2.00c.
Del'd Chicago	.....	2.20c. to 2.30c.
P.o.b. Worcester	.....	2.00c. to 2.10c.
Fender stock, No. 20, gauge, Pittsburgh or Cleveland	.....	2.55c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

Extras of 10c. a 100 lb. on mixed and joint carloads, 20c. on pool carloads and 30c. on less than carloads are applied on all merchant wire products. In carloads and mixed carloads a discount of 10 per cent on extras is allowed.

To Manufacturing Trade

Bright wire	.....	2.10c.
Spring wire	.....	3.10c.

To Jobbing Trade

Base per Keg	
Standard wire nails	..... \$1.85
Smooth coated nails	..... 1.85
Galvanized nails	..... 3.35
Base per 100 Lb.	
Smooth annealed wire	..... \$2.25
Smooth galvanized wire	..... 2.60
Polished staples	..... 2.55
Galvanized staples	..... 2.80
Barbed wire, galvanized	..... 2.35

Woven wire fence No. 9 B&W, base column, per net ton \$50.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base; Duluth, Minn. and Worcester, Mass., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills

Steel		Wrought Iron	
Inches	Black Galv.	Inches	Black Galv.
1/4	55 33	1/4	+9 1/4 +138
3/4 to 5/8	60 42	3/4 & 5/8	+1 1/2 +21 1/2
3/4	65 54	3/4	31 1/2 15
7/8	69 59	7/8	36 3/4 20 1/2
1 to 3	71 62	1 1/8	39 3/4 25 1/2
		1 1/2	43 3/4 28
		2	41 1/2 26

Lap Weld		Lap Weld	
Inches	Black Galv.	Inches	Black Galv.
2	66 57	2	37 22 1/2
2 1/2 to 6	69 60 1/2	2 1/2 to 3 3/8	38 25
7 and 8	68 58	4 to 8	40 28 1/2
9 and 10	67 57	9 to 12	38 24 1/2
11 and 12	66 56		

Butt Weld, extra strong, plain ends		Butt Weld, extra strong, plain ends	
Inches	Black Galv.	Inches	Black Galv.
1/4	52 37	1/4	+13 +45 1/2
3/4 to 5/8	58 45	3/4 & 5/8	+2 1/2 +34 1/2
3/4	63 54 1/2	3/4	32 1/2 17 1/2
7/8	68 59	7/8	37 3/4 22 1/2
1 to 3	70 62	1 to 2	43 1/2 29

Lap Weld, extra strong, plain ends		Lap Weld, extra strong, plain ends	
Inches	Black Galv.	Inches	Black Galv.
2	65 57	2	40 26
2 1/2 to 6	69 61	2 1/2 to 4 1/2	33
7 to 8	68 58	4 1/2 to 6 1/2	35 1/2
9 and 10	67 57	7 & 8	48 33
11 and 12	66 56	9 to 12	41 1/2 30

Discounts on steel and wrought iron pipe are net and not subject to any points or preferentials.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
Inches	Black Galv.	Inches	Black Galv.
2 in. and 2 1/2	.....	1 1/4 in.	..... 1
3 in.	..... 33	1 1/2 in.	..... 8
2 1/2 in.—2 3/4 in.	46	2 in.—2 1/4 in.	13
3 in.	52	2 1/2 in.—2 3/4 in.	16
3 1/2 in.—4 1/2 in.	54	3 in.	17
4 in.	57	3 1/2 in. to 3 3/4	18
1 1/2 in. to 6 in.	16	4 in.	20
		4 1/2 in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two five per cent on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap welded steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload 4 points under base and two five. Charcoal iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold-Drawn		Cold-Drawn	
Inches	Black Galv.	Inches	Black Galv.
1 in.	..... 61	3 in.	..... 48
1 1/4 to 1 1/2 in.	33	3 1/4 to 3 1/2 in.	48
1 3/4 in.	37	4 in.	51
2 to 2 1/4 in.	32	4 1/2, 5 and 6 in.	40
2 1/2 to 2 3/4 in.	40		

Hot Rolled

2 and 2 1/4 in.	.....	3 1/4 to 3 1/2 in.	54
2 1/2 and 2 3/4 in.	48	4 in.	57
3 in.	52	4 1/2, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb. base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. in lighter than standard gauges take the mechanical tube list and discounts. Intermediate sizes and gauges not listed take price of next larger outside diameter and heavier gauge.

Seamless Mechanical Tubing

Per Cent Off List	
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 40% base	50
Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.	

RAILS AND TRACK SUPPLIES

Rails

Per Gross Ton	
Standard, f.o.b. mill	..... \$40.00
Light (from billets), f.o.b. mill	..... 30.00
Light (from rail steel, f.o.b. mill)	..... 26.00

Track Equipment

Base per 100 Lb.	
Spikes, 9/16 in. and larger	..... \$2.15
Spikes, 1/2 in. and larger	..... 2.30
Spikes, boat and barge	..... 2.60
Tie plates, steel	..... 1.75
Angle bars	..... 2.55
Track bolts, to steam railroads	..... 3.50
Track bolts, to jobbers, all sizes, (per 100 count)	..... 73 per cent off list

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List	
Machine bolts	..... 75
Carriage bolts	..... 75
Lag bolts	..... 75
Plow bolts, Nos. 1, 2, 3 and 7 heads	75
Hot-pressed nuts, blank or tapped, square	75
Hot-pressed nuts, blank or tapped, hexagonal	75
C.p.c. and L. square or hex nuts, blank or tapped	75

* F.o.b. Chicago, New York and Pittsburgh.

Bolts and Nuts

Per Cent Off List	
Semi-finished hexagon nuts	..... 75
Semi-finished hexagon castellated nuts, S.A.E.	75
Stove bolts in packages, P'gh	75, 25 and 10
Stove bolts in packages, Chicago	75, 25 and 10
Stove bolts in pkgs., Cleveland	75, 25 and 10
Stove bolts in bulk, P'gh	..... 86
Stove bolts in bulk, Chicago	..... 86
Stove bolts in bulk, Cleveland	..... 86
Tire bolts	..... 60 and 10
Discounts of 75 per cent off on bolts and nuts applies on carload business with jobbers and large consumers.	

Large Rivets

Base per Lb.	
F.o.b. Pittsburgh or Cleveland	..... \$2.25
F.o.b. Chicago	..... 2.35

Small Rivets

Per Cent Off List	
(7/16-in. and smaller)	
F.o.b. Pittsburgh	..... 70, 10 and 10
F.o.b. Cleveland	..... 70, 10 and 10
F.o.b. Chicago	..... 70, 10 and 10

<

Skeip	
(P.o.b. Pittsburgh or Youngstown)	
Grooved	Per Lb.
Universal	1.60c.
Sheared	1.60c.

Wire Rods	
(Common soft, base)	
Pittsburgh	Per Gross Ton
Cleveland	\$35.00
Chicago	\$36.00

COKE, COAL AND FUEL OIL

Coke	
Per Net Ton	
Furance, f.o.b. Connellsville	\$1.75 to \$2.00
Foundry, f.o.b. Connellsville	
Foundry, by-product, Chicago	2.50 to 4.00
switching districts	7.00
Foundry, by-product, delivered in Chicago switching district	7.75
Foundry, by-product, New England, delivered	10.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	8.80
Foundry, by-product, Cleveland, delivered	7.82
Foundry, by-product, St. Louis, f.o.b. even	5.00
Foundry, by-product, del'd St. Louis	9.00

Coal	
Per Net Ton	
Mine run steam coal, f.o.b. W. Pa. mines	\$1.00 to \$1.15
Mine run coking coal, f.o.b. W. Pa. mines	1.10 to 1.25
Gas coal, 1/2-in., f.o.b. Pa. mines	1.35 to 1.40
Mine run gas coal, f.o.b. Pa. mines	1.30 to 1.35
Steam slack, f.o.b. W. Pa. mines	0.25 to 0.35
Gas slack, f.o.b. W. Pa. mines	0.25 to 0.45

Fuel Oil	
Per Gal. f.o.b. Bayonne, N. J.	
No. 2 distillate	4.00c.
No. 4 industrial	5.50c.
Per Gal. f.o.b. Baltimore	
No. 2 distillate	4.00c.
No. 4 industrial	5.50c.
Per Gal. del'd Chicago	
No. 2 industrial fuel oil	3.25c.
No. 3 industrial fuel oil	2.85c. to 2.75c.
Per Gal. f.o.b. Cleveland	
No. 2 distillate	5.25c.
No. 4 industrial	4.75c.

REFRACTORIES

Fire Clay Brick	
Per 1000 f.o.b. Works	
High-heat Intermediate Duty Brick	\$35.00 to \$50.00
Duty Brick	35.00 to 50.00
Penn.	35.00 to 50.00
Maryland	35.00 to 50.00
New Jer.	35.00 to 50.00
Ohio	35.00 to 50.00
Kentucky	35.00 to 50.00
Missouri	35.00 to 50.00
Illinois	35.00 to 50.00
Ground fire clay, per ton	6.50

Chrome Brick	
Per Net Ton	
Standard size	\$42.50

Silica Brick	
Per 1000 f.o.b. Works	
Pennsylvania	\$35.00 to \$50.00
Chicago	35.00 to 50.00
Birmingham	35.00 to 50.00
Silica clay, per ton	8.00

Magnesite Brick	
Per Net Ton	
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	\$61.50
Unburned, f.o.b. Baltimore and Chester, Pa.	62.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	55.50
Domestic, f.o.b. Chewelah, Wash.	50.00

CAST IRON PIPE

Per Net Ton	
8-in. and larger, del'd Chicago	\$41.40
4-in., del'd Chicago	44.40
8-in. and larger, del'd New York	55.30
4-in., del'd New York	58.30
8-in. and larger, Birmingham	52.00
4-in., Birmingham	56.00

Class "A" and gas pipe, \$3 extra.

VALLEY	
Per Gross ton, f.o.b. Valley furnace:	
Basic	\$13.50
Bessemer	15.00
Gray Forge	14.50
No. 2 foundry	14.50
N. 3 foundry	14.00
Malleable	14.50
Low phosph., copper free	23.00

Freight rate to Pittsburgh or Cleveland district, \$1.80.

PITTSBURGH	
Per Gross ton, f.o.b. Pittsburgh district furnace:	
Basic	\$14.00
No. 2 foundry	15.00
No. 3 foundry	14.50
Malleable	15.00
Bessemer	15.50

Freight rates to points in Pittsburgh district range from 60c. to \$1.26.

CHICAGO	
Per gross ton at Chicago furnaces:	
N't'n No. 2 fdy.	\$15.50
N't'n No. 1 fdy.	15.00
Malleable, not over 2.30 all.	15.50
High phosphorus	15.50
Lake Super. charcoal, all. 1.50, by rail	23.17
Southern No. 1 fdy.	16.14
Low phosph., all. 1 to 2, copper free.	25.00
Silvery, sil. 3 per cent.	23.67
Bess. ferro-sil. 15 per cent.	28.92

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including a switching charge.

St. LOUIS	
Per gross ton at St. Louis:	
No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City.	\$17.50
Malleable, f.o.b. Granite City	17.50
N't'n No. 2 fdy., del'd	17.80
St. Louis	17.80
N't'n malleable, del'd	17.80
N't'n basic, del'd	17.80

Freight rates 85c. (average) Granite City to St. Louis; \$2.30 from Chicago; \$4.50 from Birmingham.

NEW YORK	
Per gross ton, delivered New York district:	
Buffalo, No. 2, del'd east	\$17.41
Buffalo malleable, del'd Eastern	17.91
East Pa. No. 2 fdy.	15.02
East Pa. No. 2X fdy.	15.27

Freight rates: \$1.53 to \$2.63 from eastern Pennsylvania. Prices delivered to New Jersey cities having rate of \$3.41 a ton from Buffalo.

BUFFALO	
Per gross ton, f.o.b. furnace:	
No. 2 fdy.	\$16.00
No. 2X fdy.	16.50
No. 1 fdy.	17.50
Malleable, sil. up to 2.35	16.50
Basic	15.50
Lake Superior charcoal, del'd	23.41

CINCINNATI	
Per gross ton, delivered Cincinnati:	
Ala. fdy., sil. 1.75 to 2.25	\$13.82
Ala. fdy., sil. 2.25 to 2.75	14.32
Tenn. fdy., sil. 1.75 to 2.25	13.82
N't'n No. 2 foundry	\$17.61 to 17.59
S't'n Ohio silvery	21.02

Freight rates, \$2.02 from Ironton and Jackson, Ohio; \$3.93 from Birmingham.

CLEVELAND	
Per gross ton at Cleveland furnaces:	
N't'n No. 2 fdy. (local delivery)	\$15.00
S't'n fdy., sil. 1.75 to 2.25	16.14
Malleable (local delivery)	15.00
Ohio silvery, 8 per cent.	21.87
Stand. low phosph., Valley	23.00

Prices are f.o.b. furnace except on Southern foundry and silvery from. Freight rates: 63c. average local switching charge; \$3.12 from Jackson, Ohio; \$6.14 from Birmingham.

PHILADELPHIA	
Per gross ton at Philadelphia:	
East. Pa. No. 2	\$14.34
East. Pa. No. 2X	14.59
East. Pa. No. 1X	14.84
Basic (del'd east, Pa.)	14.00
Malleable	15.34
Stand. low phosph. (f.o.b. east. Pa. furnace)	20.00 to 21.00
Cop. b'r'g low phosph. (f.o.b. furnace)	20.00 to 21.00
Va. No. 1	21.19
Va. No. 2X	22.29

Prices, except as specified otherwise, are del'd Philadelphia. Freight rates: 84c. to \$1.79 from eastern Pennsylvania furnaces; \$4.67 from Virginia furnaces.

Pig Iron, Ores, Ferroalloys

BIRMINGHAM	
Per gross ton, f.o.b. Birmingham dist. furnace:	
No. 2 fdy., 1.75 to 2.25 sil.	\$11.00
No. 2 soft, 2.25 to 2.75 sil.	11.50
Basic	11.00

NEW ENGLAND	
Per gross ton delivered to most New England points:	
*Buffalo, sil. 1.75 to 2.25	\$19.05
*Buffalo, sil. 2.25 to 2.75	19.30
*Buffalo, sil. 1.75 to 2.25	18.03
*Buffalo, sil. 2.25 to 2.75	18.28
*Ala., sil. 1.75 to 2.25	15.64
*Ala., sil. 2.25 to 2.75	16.14

Freight rates: \$5.05 all rail from Buffalo, and \$3.60 to \$4.03 rail and water from Buffalo when \$1.25 barge and \$2.13 to New England freight rate are obtainable; \$5.64 rail and water from Alabama to New England seaboard.

* All-rail rate.

† Rail-and-water rate.

CANADA	
Per gross ton:	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$22.60
No. 2 fdy., sil. 1.75 to 2.75	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	\$23.00 to 23.50

Ferromanganese	
Per Gross Ton	
Domestic, 80%, seaboard	\$68.00
Foreign, 80%, Atlantic or Gulf port, duty paid	61.00

*Contract price; spot quotation \$61.

Prices for lots of one carload or more; extras applied on less than carload lots.

Spiegeleisen	
Per Gross Ton Furnace	
Domestic, 19 to 21%	\$24.00
Electric Ferrosilicon	
Per Gross Ton Delivered	
50% (carloads)	\$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b. Welland, Ont. (in carloads))	31.00
14% to 16% (less carloads)	36.00

Bessemer Ferrosilicon	
F.o.b. Jackson County, Ohio, Furnace	
Per Gross Ton	
10%	\$20.50
11%	21.00
12%	21.50
13%	22.50
14%	23.50

Silvery Iron	
F.o.b. Jackson County, Ohio, Furnace	
Per Gross Ton	
6%	\$18.00
7%	18.50
8%	18.75
9%	19.00
10%	19.50
11%	20.00

Other Ferroalloys	
Ferrotungsten, per lb. wt. del.	
carloads	\$4c.
Ferrotungsten, less carloads	\$1.00

PITTSBURGH	
Per gross ton delivered consumers' yards:	
No. 1 heavy melting	\$9.50 to \$10.50
No. 2 heavy melting	8.00 to 8.50
No. 2 railroad wrought	9.50 to 10.00
Scrap rails	9.50 to 10.00
Rails 3 ft. and under	10.50 to 11.00
Sheet bar crops, ordinary	10.00 to 10.50
Compressed sheet steel	9.50 to 10.00
Hand bundled sheet steel	8.00 to 8.50
Low phosph. punchings	7.50 to 8.00
Machine shop turnings	6.75 to 7.25
Short shov. steel turnings	6.75 to 7.25
Short mixed borings and turnings	5.75 to 6.25
Cast iron borings	5.75 to 6.25
Cast iron carwheels	8.00 to 8.50
Heavy breakable cast	8.00 to 8.50
No. 1 cast	8.50 to 9.00
Rail, knuckles and coup-	
lets	10.00 to 11.00
Rail, coil and leaf springs	10.00 to 11.00
Rolled steel wheels	10.00 to 11.00
Low phosph. billet crops	11.00 to 11.50
Low phosph. sheet bar crops	11.00 to 11.50
Low phosph. plate scrap	10.00 to 10.50
Low phosph. punchings	10.50 to 11.00
Steel car axles	10.00 to 10.50

CHICAGO	
Delivered Chicago district consumers:	
Per Gross Ton	
Heavy melting steel	\$5.00 to \$5.50
Shoveling steel	5.00 to 5.50

Ferrocromium, 4 to 8% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	9.50c.
Ferrocromium, 2% carbon	16.50c. to 17.00c.
Ferrocromium, 1% carbon	17.50c. to 18.00c.
Ferrocromium, 0.10%	19.50c. to 20.00c.
Ferrocromium, 0.06%	20.00c. to 20.50c.
Ferrovandium, del. per lb. contained Va.	\$3.00 to \$3.41
Ferrocobaltum, 15 to 18%, per net ton, f.o.b. furnace in carloads	190.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with \$2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	80c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	\$36.00
Ton lots or less, per ton	41.00
Silico-manganese, gross ton, delivered	
2.50% carbon grade	25.00
2% carbon grade	20.00
1% carbon grade	100.00
Spot prices	\$5 a ton higher

Ores	
Lake Superior Ore, Delivered Lower Lake Ports	
Per Gross Ton	
Old range Bessemer, 51.5% iron	\$4.25
Old range, non-Bessemer, 51.50% iron	4.50
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.40
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore	
Per Unit	
Iron, low phosph., copper free, 55 to 58% iron, dry Spanish or Algerian	\$8.00 to 8.50c.
Iron, low phosph., Swedish, average 68% iron or foundry, Swedish, average, 65% iron	8c.
Iron, basic or foundry, Russian, average 63% iron (nom.)	8c.
Manganese, Caucasian, washed 53%	21c.
Manganese, African, Indian, 50-52%	21c. to 22c.
Manganese, Brazilian, 48 to 49%	19c.

Tungsten, Chinese wolframite, duty paid	
Per Net Ton Unit	
Tungsten, domestic scheelite	\$10.00
Per Gross Ton	
Chrome, 45%, Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard	18.00
Chrome, 45%, Cr ₂ O ₃ , c.i.f. Atlantic seaboard	18.00

*Quotations nominal in absence of sale.

Fluorspar	
Per Net Ton	
Domestic, washed gravel 85-8, f.o.b. Kentucky and Illinois	\$9.00
No. 2 lump 85-8, f.o.b. Kentucky and Illinois mines	\$11.00 to 11.50
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	\$16.50 to 16.75
Domestic, No. 1 ground bulk, 85 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	20.00

Iron and Steel Scrap

Hydraulic comp. sheets	4.00 to 4.50
Drop forge flashings	4.00 to 4.50
No. 1 bushelling	4.00 to 4.50
Rolled carwheels	7.00 to 7.50
Railroad tires	8.00 to 8.50
Railroad leaf springs	7.75 to 8.25
Axle turnings	4.50 to 5.00
Steel couplers and knuckles	6.00 to 6.50
Coil springs	3.25 to 3.75
Axle turnings (elec. fur.)	5.50 to 6.00
Low phosph. punchings	8.00 to 8.50
Low phosph. plates, 12 in. and under	8.00 to 8.50
Cast iron borings	3.50 to 4.00
Short shoveling turnings	2.00 to 2.50
Machine shop turnings	2.00 to 2.50
Rolling rails	7.50 to 8.00
Steel rails, less than 3 ft.	7.50 to 8.00
Steel rails, less than 3 ft.	8.00 to 8.50
Angle bars, steel	7.00 to 7.50
Cast iron carwheels	8.00 to 8.50
Railroad malleable	6.25 to 6.75
Agricultural malleable	5.00 to 5.50

Per Net Ton	
Iron car axles	\$11.00 to \$11.50
Steel car axles	8.50 to 9.00
No. 1 railroad wrought	4.50 to 5.00
No. 2 railroad wrought	4.50 to 5.00

No. 2 busheling	\$2.00 to \$2.50
Locomotive tires, smooth	7.50 to 8.50
Pipe and flues	1.25 to 1.75
No. 1 machinery cast	6.75 to 7.25
Clean automobile cast	7.25 to 7.75
No. 1 railroad cast	6.00 to 6.50
No. 1 agricultural cast	5.75 to 6.25
Stove plate	5.50 to 6.00
Gate bars	6.25 to 6.75
Brake shoes	6.00 to 6.50

* Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$6.50 to \$7.00
No. 2 heavy melting steel	5.00 to 5.50
No. 1 railroad wrought	7.50 to 8.00
Bundled sheets	4.00 to 4.50
Hydraulic compressed, new	5.50 to 6.00
Hydraulic compressed, old	4.00 to 4.50
Machine shop turnings	3.50 to 4.00
Heavy axle turnings	5.50 to 6.00
Cast borings	3.50 to 3.75
Heavy breakable cast	8.50
Stove plate (steel works)	5.50 to 6.00
No. 1 low phosph. heavy	10.00 to 10.50
Couplers and knuckles	8.50 to 9.00
Boiled steel wheels	8.50 to 9.00
No. 1 blast furnace	3.50 to 3.75
Spec. iron and steel pipe	6.50 to 7.00
Shafting	12.00 to 13.00
Steel axles	12.00 to 13.00
No. 1 forge fire	5.50 to 6.00
Cast iron car wheels	8.50
No. 1 cast	8.00 to 9.00
Cast borings (chem.)	8.00 to 10.00
Steel rails for rolling	9.00 to 9.50

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$7.00 to \$7.25
No. 2 heavy melting steel	6.25 to 6.50
Compressed sheet steel	6.50 to 6.75
Light bundled sheet stamp-	
ings	4.00 to 4.50
Drop forge flashings	4.00 to 4.50
Machine shop turnings	4.00 to 4.50
Short shoveling turnings	3.75 to 4.25
No. 1 busheling	5.25 to 5.50
Steel axle turnings	5.00 to 5.50
Low phosph. billet crops	10.00 to 11.00
Cast iron borings	4.50 to 5.00
Mixed borings and short	
turnings	4.50 to 5.00
No. 2 busheling	4.50 to 4.75
No. 1 cast	7.00 to 7.50
Railroad grate bars	5.00 to 5.50
Stove plate	5.00 to 5.50
Rolls under 3 ft.	8.50 to 9.00
Rolls for rolling	8.50 to 9.00
Railroad malleable	6.75 to 7.00
Cast iron car wheels	8.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:	
No. 1 heavy melting steel	\$7.00 to \$7.25
No. 2 heavy melting scrap	5.50 to 6.00
Scrap rails	6.00 to 6.50
New hydraulic, comp. sheets	5.50 to 6.00
Old hydraulic, comp. sheets	5.00
Drop forge flashings	5.50 to 6.00
No. 1 busheling	5.50 to 6.00
Erv. steel axle turnings	4.00 to 4.50
Machine shop turnings	4.00 to 4.50
Knuckles and couplers	9.00
Coll and leaf springs	9.00
Boiled steel wheels	9.00
Low phosph. billet crops	9.00 to 9.50
Short steel turnings	5.50 to 6.00
Short mixed borings and	
turnings	3.75 to 4.25
Cast iron borings	3.75 to 4.25
No. 2 busheling	3.50 to 4.00
Steel car axles	10.00 to 11.00
Iron axles	10.00 to 11.00
No. 1 machinery cast	9.50 to 10.00
No. 1 cupola cast	8.50 to 9.00
Stove plate	7.00 to 7.50
Steel rails, 3 ft. and under	8.50 to 9.00
Cast iron car wheels	8.00 to 9.00
Industrial malleable	7.00 to 7.50
Railroad malleable	7.00 to 7.50
Chemical borings	7.50 to 8.00

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$7.00 to \$7.50
Scrap steel rails	7.00 to 7.50
Short shoveling turnings	4.00
Stove plate	6.00
Steel axles	9.00
Iron axles	9.00
No. 1 railroad wrought	4.50 to 5.00
Rails for rolling	7.50 to 8.00
No. 1 cast	8.50
Tramcar wheels	8.00
Cast iron borings, chem.	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$5.50 to \$6.00
No. 1 heavy melting	5.25 to 5.50
No. 3 heavy melting	4.75 to 5.25
No. 1 locomotive tires	5.00 to 5.50
Misc. stand-sec. rails	6.00 to 6.50
Railroad springs	6.25 to 6.75
Bundled sheets	2.00 to 2.50
No. 2 railroad wrought	5.00 to 5.50
No. 1 busheling	3.50 to 4.00
Cast iron borings and	
shoveling turnings	1.25 to 1.75
Rails for rolling	7.50 to 8.00
Machine shop turnings	1.25 to 1.75
Heavy turnings	3.00 to 3.50
Steel car axles	8.50 to 9.00
Wrought iron bars and trans.	4.00 to 4.50
No. 1 railroad wrought	3.50 to 4.00
Steel rails less than 3 ft.	7.50 to 8.00
Steel angle bars	6.00 to 6.50
Cast iron car wheels	5.50 to 6.00
No. 1 machinery cast	7.00 to 7.50
Railroad malleable	4.00 to 4.50
No. 1 railroad cast	3.25 to 3.75
Stove plate	6.00 to 6.50
Relay rails, 60 lb. and	
under	10.00 to 10.50

Relay rails, 60 lb. and over \$20.00 to \$21.00
Agricul. malleable 4.00 to 4.50

BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$3.00 to \$3.25
Scrap T rails	2.50 to 2.75
Machine shop turnings	0.80 to 1.00
Cast iron borings	1.05
Bundled skeleton, long	2.00 to 2.10
Forge flashings	0.90 to 1.00
Blast furnace scrap	0.90 to 1.00
Forge scrap	3.00 to 3.25
Shafting	9.50 to 10.00
Steel car axles	9.00 to 9.50
Wrought pipe	4.00 to 4.25
Rails for rolling	4.50 to 5.00
Cast iron borings, chemical	7.00 to 7.25

Per gross ton delivered consumers' yards:	
Textile cast	\$7.00 to \$7.50
No. 1 machinery cast	7.50 to 8.00
Stove plate	5.00 to 5.25
Railroad malleable	8.00 to 8.50

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$3.50 to \$5.00
No. 2 heavy melting steel	3.50 to 4.00
Heavy melting steel (yard)	1.50
No. 1 heavy breakable cast	5.00 to 5.25
Stove plate (steel works)	2.50 to 2.90
Machine shop turnings	0.75 to 1.25
Short shoveling turnings	0.75 to 1.25
Cast borings	0.50 to 1.00
No. 1 blast furnace	0.50 to 1.00
Steel car axles	8.00 to 8.50

Base per Lb.	
Plates	2.85c
Structural shapes	2.85c
Soft steel bars and small shapes	2.60c
Reinforcing steel bars	2.60c
Cold-finished and screw stock	
Rounds and hexagons	2.95c
Squares and flats	3.45c
Hoops and bands, under 1/4 in.	2.95c
Hot-rolled annealed sheets (No. 24)	
Galv. sheets (No. 24), 25 or more	3.10c
bundles	3.35c
Hot-rolled sheets (No. 10)	2.65c
Galv. corrug. sheets (No. 28), per	
square (less than 3750 lb.)	\$3.61
Spikes, large	2.40c
Small	2.65c
Boat	2.90c
Track bolts, all sizes, per 100 count	
70 per cent off list	

Machine bolts, 100 count	
70 per cent off list	
Carriage bolts, 100 count	
70 per cent off list	
Nuts, all styles, 100 count	
70 per cent off list	
Large rivets, base per 100 lb.	\$3.00
Wire, black, soft ann't'd, base per	
100 lb.	2.65
Wire, galv. soft, base per 100 lb.	3.10
Common wire nails, per keg	2.20
Cement coated nails, per keg	2.20

On plates, structurals, bars, reinforcing	
bars, bands, hoops and blue annealed	
sheets, base applied to orders of 400 to	
999 lb.	

CHICAGO

Base per Lb.	
Plates and structural shapes	3.00c
Soft steel bars	2.75c
Reinforc. bars, billet steel	3.50c
Rail steel reinforcement	1.30c to 1.45c
Cold-fin. steel bars and shafting	
Rounds and hexagons	3.00c
Flats and squares	3.50c
Bands, 3/16 in. (in Nos. 10 and	
12 gage and lighter)	2.95c
Hoops (No. 14 gage and lighter)	3.50c
Hot-rolled annealed sheets (No. 24)	3.45c
Galv. sheets (No. 24)	3.50c
Hot-rolled sheets (No. 10)	2.75c
Spikes (3/16 in. and lighter)	3.45c
Track bolts	4.30c
Rivets, structural (keg lots)	2.75c
Rivets, boiler (keg lots)	2.75c

Per Cent Off List	
Machine bolts	65
Carriage bolts	65
Coach and lag screws	65
Hot-pressed nuts, sq. blank or	
tapped, 200 lb. or more	65
Hot-pressed nuts, hex. blank or	
tapped, 00 lb. or more	65
Cold-pressed steel bars	65
Hot-pressed nuts, hex. blank or	
tapped, 00 lb. or more	65
Flat head bright wood screws	75
Cup point set screws	75
Spring cotter pins	60 and 10
Stove bolts	80
Rd. hd. tank rivets, 7/16 in. and	
smaller	65
Wrought washers	\$4.50 off list
No. 8 black ann't'd wire, per 100 lb.	\$3.45
Comm. wire nails, base per keg	2.30
Cement c'd'd nails, base per keg	2.30

NEW YORK

Base per Lb.	
Plates and struc. shapes	3.10c
Soft steel bars, small shapes	3.10c
Iron bars	3.24c
Iron bars, Sored, charcoal	6.75c to
Cold-fin. shafting and screw stock	
Rounds and hexagons	3.54c
Flats and squares	4.04c
Cold-roll. strip, soft and quarter	
hard	4.95c
Hoops	3.80c
Bands	3.80c
Hot-rolled sheets (No. 10)	2.75c
Hot-rolled ann't'd sheets (No. 24)	3.25c
Galvanized sheets (No. 24)	3.50c
Long term sheets (No. 24)	4.50c
Standard tool steel	12.00c
Wire, black annealed (No. 10)	3.80c
Wire, galv. annealed (No. 10)	4.05c
Tire steel 1/2 x 1/2 in. and larger	3.40c
Smooth finish, 1 to 2 1/2 x 1/2 in.	
and larger	3.75c

Spec. iron and steel pipe	\$2.50 to \$2.75
Forge fire	2.75 to 3.00
No. 1 railroad wrought	4.00 to 4.50
No. 1 yard wrought long	3.25 to 3.50
Rails for rolling	5.00 to 5.50
No. 1 cast	4.50
No. 2 cast	4.50
Stove plate (foundry)	4.50
Malleable cast (railroad)	4.00 to 4.50
Cast borings (chemical)	6.50 to 6.50
Per gross ton, delivered local foundries	
No. 1 machinery cast	\$9.00
No. 1 hvy. cast (cupola	
size)	7.50 to 8.00
No. 2 cast	4.00 to 4.50

CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel	\$5.25 to \$5.75
Scrap rails for melting	6.00 to 6.50
Loose sheet clippings	1.00 to 1.50
Bundled sheets	3.75 to 4.25
Cast iron borings	3.00 to 3.50
Machine shop turnings	3.00 to 3.50
No. 1 busheling	5.00
No. 2 busheling	2.75 to 3.25
Rails for rolling	6.50 to 7.00
No. 1 locomotive tires	7.00 to 7.50
Short rails	9.00 to 9.50
Cast iron car wheels	6.50 to 7.00
No. 1 machinery cast	6.50 to 7.00
No. 1 railroad cast	6.00 to 6.50
Burnt cast	4.25 to 4.75
Stove plate	4.25 to 4.75
Agricultural malleable	6.75 to 7.25
Railroad malleable	7.00 to 7.50

Open hearth spring steel, base	
4.50c to 7.00c	
Common wire nails, base, per keg	\$2.60
Per Cent Off List	
Machine bolt, cut thread:	
1/2 x 6 in. and smaller	.65 to .65 and 10
3/4 x 6 in. and smaller	.65 to .65 and 10
Carriage bolts, cut thread:	
1/2 x 6 in. and smaller	.65 to .65 and 10
3/4 x 20 in. and smaller	.65 to .65 and 10
Boiler tubes:	
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	\$3.68

* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.	
Plates and struc. shapes	3.25c
Bars, soft steel or iron	3.00c
Cold-fin. rounds, shafting, screw	
stock	3.95c
Hot-rolled annealed sheets (No. 24)	3.70c
Galv. sheets (No. 24)	4.00c
Hot-rolled sheets (No. 10) up	
to and inc. 48 in. wide	3.00c
over 48 in. wide	3.15c
Black corrug. sheets (No. 24)	3.75c
Galv. corrug. sheets	4.05c
Structural rivets	4.00c
Boiler rivets	4.00c

Per Cent Off List	
Tank rivets, 7/16 in. and smaller,	
100 lb. or more	65
Less than 100 lb.	60
Machine bolts	65
Carriage bolts	65
Lag screws	65
Hot-pressed nuts, sq. blank or	
tapped, 200 lb. or more	65
Less than 200 lb.	55
Hot-pressed nuts, hex. blank or	
tapped, 00 lb. or more	65
Less than 200 lb.	55

PHILADELPHIA

Base per Lb.	
* Plates, 1/4-in. and heavier	2.45c
* Structural shapes	2.45c
* Soft steel bars, small shapes, iron	
bars (except bands, sq. twisted and	
deform)	2.45c
Reinforc. steel bars, sq. twisted and	
deform	2.30c
Cold-finished steel bars	3.35c
* Steel hoops	3.00c
* Steel bands, No. 12 to 3/16 in.,	
incl.	2.75c
Spring steel	5.00c
* Hot-rolled annealed sheets (No. 24)	3.15c
* Galvanized sheets (No. 24)	3.50c
* Hot-rolled annealed sheets (No.	
10)	2.70c
Diam. pat. floor plates, 1/4 in.	5.00c
Swedish iron bars	5.60c

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

* Base prices subject to deductions on orders aggregating 4000 lb. or over.

† For 50 bundles or over.

CLEVELAND

Base per Lb.	
Plates and struc. shapes	2.95c
Soft steel bars	2.75c
Reinforc. steel bars	1.75c to 1.95c
Cold-fin. steel bars	3.00c
Flat rolled steel under 1/4 in.	2.95c
Cold-finished strip	5.55c
Hot-rolled annealed sheets (No. 24)	3.25c
Galvanized sheets (No. 24)	3.50c
Hot-rolled sheets (No. 10)	3.00c
Black ann't'd wire, per 100 lb.	\$2.55
No. 8 wire, base per 100 lb.	2.90
Comm. wire nails, base per keg	2.10

* Net base, including boxing and cutting to length.

CINCINNATI

Base per Lb.	
Plates and struc. shapes	3.25c
Bars, soft steel or iron	3.00c
New billet reinforcement	3.00c
Rail steel reinforcement	3.00c
Hoops	3.90c
Bands	3.20c
Cold-fin. rounds and hex.	3.35c

DETROIT

Dealers' buying prices per gross ton:	
Hvy. melting steel.....	\$5.50 to \$6.00
Borings and short turnings.....	3.50 to 4.00
Long turnings.....	3.00 to 3.50
No. 1 machinery cast.....	7.75 to 8.25
Automotive cast.....	5.50 to 9.00
Hydraulic, comp. sheets.....	4.75 to 5.25
Stove plate.....	3.00 to 3.50
New No. 1 busheling.....	4.50 to 5.00
Old No. 2 busheling.....	2.50 to 3.00
Sheet clippings.....	2.00 to 2.50
Flashings.....	3.25 to 3.75

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Continental Can Co., 1 Pershing Square, New York, has taken bids on general contract for one-story plant, 140 x 160 ft., at Houston, Tex., with foundations for two additional floors later, for production of tin cans. Initial cost close to \$100,000 and ultimate cost over \$250,000 with machinery. R. J. Cummins, Bankers' Mortgage Building, Houston, is architect and engineer.

Schock, Gusmer & Co., Inc., 857 Tenth Avenue, New York, manufacturer of brewing machinery, parts, etc., has purchased plant of Federal Metal Bed Co., Hoboken, N. J., site, 200 x 825 ft., with factory of 85,000 sq. ft. floor space, for new plant. It is understood that company will remove part of branch plant at Philadelphia to new location.

Kaz Mfg. Co., Inc., Utica, N. Y., has been organized by Alexander Pirnie, 1424 Genesee Street, and Ernest N. Warren, 1205 West Street, to manufacture heaters, ventilators and kindred products.

Piel Brothers, Georgia Avenue, Brooklyn, plans addition to brewery to increase capacity from 800 to 1200 bbl. a day. Cost over \$600,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 18 for washers, bolts, nuts, sheet piling, etc. (Schedule 9863).

Hittleman & Munsch Brewery, 1 Bushwick Avenue, Brooklyn, Edward B. Hittleman, president, has let general contract to Aetna Construction Co., 110 West Fortieth Street, New York, for improvements and modernization in four-story plant. Cost \$150,000 with equipment.

Signal Supply Officer, Army Base, Brooklyn, asks bids until May 1 for 4100 miles of wire (Circular 100).

Metal Ornament Corp., New York, has been organized by Albert Falick, 1528 St. Johns Place, Brooklyn, and associates, to manufacture metal specialties.

Kings Brewery, Inc., Brooklyn, operating former plant of Excelsior Brewery, 227-81 Pulaski Street, has plans for new brewhouse, refrigerating plant, bottling works, power house and other units. Cost about \$1,000,000 with machinery. Shampian & Shampian, 188 Montague Street, are architects.

United States Smelting, Refining & Mining Co., 57 William Street, New York, is considering new lead refinery near works at Salt Lake City, Utah. Cost over \$400,000 with equipment. Headquarters are at 1 State Street, Boston.

Commanding Officer, Watervliet Arsenal, Watervliet, N. Y., asks bids until April 17 for machine bolts, track bolts, lag screws, tie plates and washers (Circular 27); cold drawn tubing and stainless steel tubing (Circular 31); two alloy steel forgings (Circular 30).

Atlas Pipe Railing Co., Inc., Long Island City, has been organized by Louis Roser, 41-05 Ninety-fourth Street, Jackson Heights, L. I., and associates, to manufacture pipe railings and other iron and steel specialties.

Capitol Luminous Tube Sign Co., 54 Kent Street, Newark, manufacturer of electric signs and displays, has leased two-story factory at Fourteenth Avenue and Fourteenth Street, for new plant and will remove to new location and increase capacity.

R. C. A. Radiotron Co., Inc., South Fifth Street, Harrison, N. J., manufacturer of radio tubes and equipment, is arranging for early removal of branch plant at Cleveland, giving employment to about 1200 persons, to main works at Harrison, where expansion will be carried out. Company is a subsidiary of Radio Corp. of America, 570 Lexington Avenue, New York.

J. J. Murphy Brewing Co., Trenton, N. J., care of James M. Burke, Broad Street Bank Building, representative, has been organized by James J. Murphy, Trenton, and associates, capital \$500,000, to establish a local brewery.

Trenton Brass & Machine Co., Prospect Avenue and Dale Street, Trenton, N. J., manufacturer of plumbers' brass goods, etc., has authorized rebuilding part of multi-story plant recently damaged by fire. Loss over \$50,000 with equipment.

Supply Officer, Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until April 17

for 150 box-socket wrenches, 50 steel hammer heads, 50 copper heads for hammers, 65 double-head wrenches, 100 carburetor jet wrenches (Aero Req. 1061), one hand-operated brake bending machine (NSAF Req. 5102); until April 20, heat-treated alloy steel bolts and engine bolts (Aero Req. 1065).

Pep Boys Auto Supply Co., Inc., Broad and Vine Streets, Philadelphia, automobile equipment and supplies, will ask new bids soon on general contract for three-story storage and distributing plant. Cost over \$125,000 with equipment. Thalheimer & Weitz, 10 South Eighteenth Street, are architects.

Standard Brewing Co., Penn Avenue and Walnut Street, Scranton, Pa., is planning extensions and improvements, including additional equipment. Company has arranged financing in amount of \$276,000, part of fund to be used for purpose noted.

Department of Public Works, Bureau of Water, City Hall Annex, Philadelphia, asks bids until April 19 for parts for water meters (Contract 1048).

American-Swede Iron Co., Harrison Building, Philadelphia, has resumed operations at mill at Danville, Pa., following shut down for several months, recalling about 100 men.

Reading Iron Co., Reading, Pa., has resumed production at branch mill at Danville, Pa., reinstating about 200 men.

Sawyer Refining Co., Inc., Bolivar, N. Y., recently organized by Wallace E. Sawyer, Bolivar, and associates, plans new oil refinery at Wellsville, N. Y. Cost over \$250,000 with machinery.

Pangborn Steam Generator Corp., Watkins Glen, N. Y., manufacturer of steam generating and allied power equipment, has arranged for increase in capital from \$100,000 to \$200,000 for expansion.

◀ CENTRAL DISTRICT ▶

Simplex Battery Co., New Castle, Pa., manufacturer of electric storage batteries, has authorized plans for rebuilding plant recently destroyed by fire. Cost about \$50,000 with equipment.

French Creek Valley Brewing Co., Meadville, Pa., recently acquired by new interests, is planning expansion and modernization, including equipment. Cost about \$250,000 with machinery.

Victor Brewing Co., Jeannette, Pa., has begun plant expansion and improvements, to include additional equipment. Cost over \$65,000. J. F. Dietrich is secretary and treasurer.

City Council, Oberlin, Ohio, plans call for bids in May for new municipal electric light and power plant, with Diesel engine-generator units and auxiliary equipment. Cost about \$250,000 with equipment. R. Husselman, Hippodrome Building, Cleveland, is consulting engineer.

Standard Brewing Co., 5801 Train Avenue, S. W., Cleveland, is planning improvements and modernization in brewery, including new equipment. Cost over \$50,000 with machinery. George Creadon is president.

Furnace & Boiler Parts Co., Cleveland, has been organized by George A. Fullerton, Joseph J. and Edmund A. Smolik, to manufacture boiler and furnace equipment. Company will take over organization of same name at 2825 Superior Avenue.

National Cash Register Co., Dayton, Ohio, has adopted full time production schedule, primarily for manufacture of cash registers for retailing of beer, replacing half-time basis operative for several months. About 3500 persons will be employed. Company is also planning early purchase of quantity of raw materials.

Board of Public Affairs, Williamsburg, Ohio, plans early call for bids for new municipal electric light and power plant. Cost about \$90,000 with equipment. H. G. Bryan, Park Avenue, Loveland, Ohio, is consulting engineer.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until April 17 for 180 bracket assemblies and 240 hangar assemblies (Circular 499); until April 18, one paper cutter machine (Circular 484); until April 19, 4000 lb. aluminum ingot (Circular 502), 300 electric soldering coppers (Circular 503); until April 24,

34,500 ft. steel tape cable (Circular 514); until April 25, 75 suction gage assemblies (Circular 513); until April 26, 98 propeller hub assemblies (Circular 501), 505 generator assemblies (Circular 489) and 254 propeller blades (Circular 500).

Renner Co., Youngstown, Ohio, formerly Renner Brewing Co., is arranging for expansion and improvements, including equipment. Company has financing plans for fund of \$172,500, portion of proceeds to be used for purpose noted. Emil A. Renner is president.

Joyce Products Co., West Second Avenue and Perry Street, Columbus, Ohio, has plans for addition and improvements to brewing plant, including equipment. Cost over \$75,000 with machinery. Bassett-Tresselt, 257 East Broad Street, is architect.

Hot Steam Heater Co., Cleveland, manufacturer of automatic and non-automatic hot water heaters, parts, etc., is concentrating production in new plant unit at 8007-13 Grand Avenue, S. E., removing two local factories and one branch plant at St. Louis to that location, where 45,000 sq. ft. floor space is available. Production will be increased.

Indiana Breweries, Inc., 946 West New York Street, Indianapolis, has begun expansion and modernization at plant, to include new machinery. Cost over \$60,000. Leo C. McNamara is president and treasurer.

Automatic Carbonator, Inc., Lafayette, Ind., has been organized by Leonard Loeffler and Paul E. Pyle, Lafayette, to manufacture carbonators, stokers, parts, etc.

Muskegon Brewing Co., Muskegon, Mich., has plans for extensions and improvements in former local brewery, including equipment. Cost over \$75,000 with machinery. Donald Lakie, Grand Rapids, Mich., is architect.

Vinco Tool Co., Detroit, has been organized by Ralph A. Putnam, Detroit, and associates, to manufacture gages, precision tools and equipment. Company will take over organization of same name at 7350 Central Avenue.

West Side Brewing Co., Grand Rapids, Mich., recently organized, has taken over former plant of Peterson Brewing Co. Plans are under way for new bottling works, three-story storage and distributing plant and other units, including improvements in present plant. Cost over \$150,000 with equipment.

C. V. S. Mfg. Co., Inc., Flint, Mich., has been organized by R. B. Vessey, 1326 Beard Street, and associates, to manufacture machinery and parts.

◀ SOUTH ATLANTIC ▶

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until April 17 for one fire engine pump and one generator (Circular 90); until April 21, steering gears, propeller shafts, water pumps, fenders, bumpers, emergency brakes and other automobile parts (Circular 89).

Monumental Brewery Co., Lombard Street, near Eighth Street, Baltimore, has plans for extensions and modernization in brewery, including additional machinery. Cost over \$50,000. P. C. Street Engineering Co., 17 East Saratoga Street, is engineer.

Quartermaster, United States Soldiers' Home, Washington, asks bids until April 20 for four new boiler units, fuel oil equipment, fuel oil tanks, piping, etc.

United States Coast Guard Headquarters, Washington, asks bids until April 17 for following equipment for Curtis Bay, Md., station: One geared-head precision engine lathe with tools and parts, one scroll saw, band saw, circular saw, jointer, one work bench, one sand-blast machine, tumbling barrel processing tank with motor drive, testing equipment, four heavy-duty shop trucks, steel stock bin units, and steel shelving.

Gunther Brews, Inc., 1211 South Conklin Street, Baltimore, will take bids soon for extensions and improvements in brewing plant. Cost over \$60,000 with equipment. C. H. Osborne, 222 West Franklin Street, is engineer.

Board of District Commissioners, District Building, Washington, asks bids until April 24 for 1000 steel posts for traffic department; until April 19, two motor patrol graders, each 10,000-lb. capacity.

Baker Equipment Engineering Co., Rockbridge and Summit Streets, Richmond, Va.,



$\frac{3}{16}$ Inch Ace Hard Rubber Tank Lining is equally suitable whether temperature is zero or 212° F...

In specifying equipment which is to be subjected to corrosive conditions, the Chemical Engineer should remember that such equipment must not only prevent corrosion, but to be truly efficient, it must operate equally well with various temperature changes.

Very often plant processes are changed and tanks purchased for use at low temperatures are required on operations at high temperatures.

Consequently, equipment that will resist the entire temperature range is preferable and the better investment.

Temperature changes are com-

pensated in Ace Hard rubber lined tanks by the natural ability of this material to withstand elongation up to 15%, and by the perfect bond of the inner soft rubber lining to the steel tank.

Ace hard rubber tank lining is tough and leathery... it resists corrosion better than soft rubber linings, and it is adaptable for

lining all kinds of equipment.

We will be glad to supply the details of what we can do to end your equipment-corrosion problems, without obligation.

Catalogue on request

AMERICAN HARD RUBBER COMPANY

11 MERCER STREET • NEW YORK, N. Y.

Akron, Ohio

111 West Washington Street, Chicago, Ill.

ACE HARD RUBBER

TANK LINING



Prevents Corrosion

plans purchase of motor-driven combination punching and shearing machine, with capacity for punching $\frac{3}{4}$ -in. holes.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 18 for one high temperature electric furnace (Schedule 9903) for Norfolk, Va., Navy Yard; six 10-ton capacity semi-trailers and one fifth wheel (Schedule 9912) for Boston yard; rubber-metal gasoline hose (Schedule 9873) for Boston, Mare Island and Puget Sound yards; five storage battery-operated crane trucks, complete with batteries, and one electric industrial truck (Schedule 9864), wire-brass, bronze, copper and steel (Schedule 9878) for Eastern and Western yards; four floor-type arbor presses (Schedule 9880) for Brooklyn, Philadelphia, Mare Island and Puget Sound yards; until April 25, blade stops, cylinder joint (Schedule 9860) for Eastern and Western yards.

◀ NEW ENGLAND ▶

Connecticut Breweries Co., Bridgeport, Conn., plans plant expansion and modernization, including new machinery. Cost over \$200,000 with equipment. J. A. Hurley is president.

Gloucester Products Co., Gloucester, Mass., has been organized by Frank C. Pearce and J. J. McLaughlin, 50 Summer Street, to manufacture mechanical and electrical devices and equipment.

Board of School Trustees, Somers, Conn., plans vocational training department in new two-story and basement grade school; general contract just let to Allyn Wadhams Co., 15 Lewis Street, Hartford, Conn. Cost over \$100,000. Paul D. Bemis, Hartford, is consulting engineer.

Fisk Rubber Co., Chicopee Falls, Mass., has been acquired at a receiver's sale by Orrin G. Wood, 388 Warren Street, Boston, representing a committee of holders of bonds and notes, for price of \$3,030,000. Plans are under way for reorganization of company plant improvements and early resumption of operations. Ferdinand Eberstadt is head of reorganization committee. Sale also includes property at Pawtucket and Westerly, R. I., New Bedford, Mass., Jewett City, Conn., and Cudahy, Wis.

Colonial Beacon Oil Co., 20 Providence Street, Boston, will soon begin new bulk oil storage and distributing plant, 35 x 130 ft., at Framingham, Mass. Cost over \$50,000 with equipment.

Shawmut Automotive & Battery Mfg. Corp., Boston, has been organized by Augustus J. Migell, 17 Grant Place, Dorchester, Mass., and associates, to manufacture automobile electric storage battery equipment.

◀ MIDDLE WEST ▶

Birk Brothers Malt Products, Inc., 2117 Ward Street, Chicago, has leased plant of Rockford Brewing Co., Rockford, Ill., for branch brewery. Extensions and improvements will be made.

Anheuser-Busch, Inc., 420 West Ontario Street, Chicago, with headquarters at St. Louis, has leased portion of brewery of Schoenhofen Co., West Eighteenth Street, about 45,000 sq. ft. space, for branch for storage and distribution. Improvements will be made.

Wheelco Vacuum Products Co., Room 717, 111 West Monroe Street, Chicago, has been organized to manufacture machinery and parts. Ralph J. Halperin is one of principal incorporators.

City Council, Havre, Mont., is arranging fund of \$115,000 for erection of a municipal gas plant and distributing system.

L. A. Snider Engineering Service, Inc., 505 North Michigan Avenue, Chicago, has plans for new brewery in northern part of Louisiana, for company whose name is temporarily withheld. Cost over \$200,000 with machinery.

Superintendent, Shoshone Indian Agency, Fort Washakie, Wyo., asks bids until April 20 for one leaning wheel-type road grader; one track-type tractor.

County Auditor, Walter H. Borgen, Court House, Duluth, Minn., asks bids until April 21 for one steel building, 24 x 40 ft., 24-gage siding, 18-gage roofing, at Albion, Minn. Plans on file at office of County Highway Engineer, S. B. Shepard, Court House, Duluth.

United States Engineer Office, First District, Chicago, asks bids until May 1 for three portable electric drills, with motors, etc. (Circular 148).

Randolph Electrical Devices Corp., Room 1725, 160 North LaSalle Street, Chicago, has

been organized by George V. O'Connell, and Ralph L. Nettland, to manufacture electrical equipment and devices.

Village Council, Mora, Minn., plans call for new bids for municipal electric light and power plant and distributing system, including Diesel engine units. Cost about \$65,000. G. M. Orr & Co., Baker Building, Minneapolis, are consulting engineers.

R. Perlick Brass Co., 1125 North Ninth Street, Milwaukee, is transferring plant and offices from Pabst Brewing Co. group to 1825 West St. Paul Avenue, increasing floor space from 10,000 sq. ft. to 15,000 sq. ft. Perlick company specializes in manufacture of brewers' and bottlers' supplies, fittings and tapping equipment.

Milwaukee Board of School Directors, 1111 North Tenth Street, Milwaukee, will be ready for bids about May 5 for construction and equipment of new boiler house, fan room, etc., at Thirty-seventh Street grade school, at cost of about \$65,000. Frank M. Harbach is business manager.

◀ SOUTHWEST ▶

Schorr-Kolschneider Brewing Co., 2537 Natural Bridge Avenue, St. Louis, plans extensions and improvements in brewery, including additional equipment. Cost about \$60,000.

Sigmon Pipe & Supply Co., Tulsa, Okla., has been organized by R. E. Sigmon, 734 North Trenton Street, and associates, to manufacture cast iron pipe and fittings, etc.

National Refining Co., Thirtieth Street and Southwest Boulevard, Kansas City, Mo., is considering new one-story bulk oil storage and distributing plant at Topeka, Kan. Cost about \$30,000 with equipment.

Champlin Refining Co., Enid, Okla., has approved plans for addition to gasoline storage and distributing plant at refinery near city, including about eight 55,000-bbl. steel tanks and auxiliary equipment.

Crescent Brewing Co., Joplin, Mo., has been organized, capital \$300,000, by George W. German and J. M. Belwood, Joplin, to establish a local brewing plant.

Schlitz Brewing Co., 957-67 State Line Avenue, Kansas City, Mo., plans extensions and improvements in plant, including additional equipment. Cost over \$65,000 with equipment.

Dixie Jubal Co., San Marcos, Tex., has leased local factory for manufacture of automobile radio equipment, receiving sets, parts, etc.

American Airways, Inc., Southern Division, Love Field, Dallas, Tex., has taken bids on general contract for new hangar, 135 x 200 ft., with two-story lean-to, 25 x 140 ft., for repair shop, at Fort Worth, Tex., where Southern headquarters will be located. Cost about \$100,000 with equipment. A. Epstein, 2001 West Pershing Road, Chicago, is architect and engineer.

Shell Petroleum Corp., Shell Building, St. Louis, is considering expansion and improvements in oil refinery at Houston, Tex., and vicinity. Cost close to \$1,000,000 with equipment. Southern Division headquarters are at New Orleans. J. C. Munro, manager.

Sterling Packing & Gasket Co., Houston, Tex., has been organized by L. J. Langdon, 718 Chelsea Street, and associates, to manufacture metal gaskets, mechanical packing specialties, etc.

◀ SOUTH CENTRAL ▶

United States Engineer Office, Memphis, Tenn., asks bids until April 26 for two steel hull, self-propelled suction dredges with 32-in. discharge, 244 ft. long, 52 ft. wide, 9 ft. deep, totaling about 1290 tons, including two 1000-hp. triple expansion, vertical, marine-type engines, complete dredging machinery, with steam turbine and reduction gearing. Cost about \$1,000,000.

Common Council, Richmond, Ky., has plans for a municipal gas plant and distributing system. Fund of \$40,000 has been secured for work.

Louisville Water Co., Louisville, has plans for new power house, including two steam-driven generators, condensers, switchboard, piping, etc. Cost over \$50,000. Alvord, Burdick & Howson, 20 North Wacker Drive, Chicago, are consulting engineers.

Constructing Quartermaster, Maxwell Field, Montgomery, Ala., asks bids until April 28 for extensions in electric distributing system, transformer station, etc. (Specification 9394).

Common Council, Sulligent, Ala., plans installation of pumping equipment, pipe lines, etc., for municipal waterworks. Fund of \$25,000 has been secured.

Swift & Co., Union Stock Yards, Chicago, have plans for two-story and basement factory branch, storage and distributing plant, 60 x 100 ft., at Louisville. Cost over \$30,000 with equipment. W. H. Ruskamp is company architect, headquarters noted.

◀ PACIFIC COAST ▶

Goodyear Tire & Rubber Co., 6701 South Central Avenue, Los Angeles, headquarters at Akron, Ohio, has awarded general contract to Myers Brothers Co., 3407 San Bernardino Road, for rebuilding part of mill recently damaged by earthquake. Cost over \$125,000 with equipment.

Southwestern Brewing Co., 402 Consolidated National Bank Building, Tucson, Ariz., recently organized, has plans for new multi-story brewery on Seventeenth Street. Cost over \$250,000 with machinery. William E. Gleason is president in charge.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 18 for one motor-driven hacksaw (Schedule 9855) for San Diego Navy Yard; rotary snap switches (Schedule 9867) for Mare Island and Puget Sound yards; until April 25, 24,000 attachment plugs (Schedule 9887), 145 gasoline filters (Schedule 9884) for Mare Island yard.

Aztec Brewing Co., San Diego, Cal., recently organized by Herbert L. Jaffe, E. P. Baker, San Diego, and associates, has taken over former plant of Savage Tire Co., and will remodel for new brewery, with initial capacity of 100,000 bbl. a year, to be increased to about 300,000 bbl. later. Cost over \$200,000 with equipment. Richard Griesser, 64 West Randolph Street, Chicago, is architect and engineer.

Blitz-Weinhard Co., Portland, has awarded general contract to Dougan-Hammond Co., Studio Building, for new two-story brewery. Cost over \$150,000 with machinery.

Olympia Brewing Co., Olympia, Wash., Adolph Schmidt, plans new brewery near Tumwater, Wash., including power house and refrigerating plant. Cost about \$275,000 with equipment.

United States Coast Guard, San Pedro Section, San Pedro, Los Angeles, has arranged with Los Angeles Harbor Commission for lease of 4-acre tract adjoining Allen Field, for new aviation base. Plans will be drawn for hangar, with repair and reconditioning shop and other field units.

Hemerich Brewing Co., Seattle, plans extensions and improvements, with installation of new equipment. Cost about \$40,000.

◀ FOREIGN ▶

Albright & Wilson, Ltd., Birmingham, England, manufacturer of heavy industrial chemicals, etc., is razing buildings at former works of Muspratt Chemical Co., Ltd., Widnes, England, and plans erection of new plant on site. Cost over \$100,000 with equipment.

London & North-Eastern Railway Co., London, England, is arranging fund over \$2,000,000 for extensions and improvements in lines, rolling stock, locomotive and car shops and other structures.

South Manchuria Railway Co., Mukden, Manchuria, is interested in project of Manchoukuo Government, Darien, to establish new Government-owned oil company, capitalized at 3,000,000 yen (about \$642,000) to erect an oil refinery at Hulutao, Manchuria, using crude oil from Russian fields. Cost over \$350,000 with machinery. Mitsui Mining Co. and Mitsubishi Oil Co., both Tokio, Japan, are interested in program.

Rust Preventing Paint Oils and Lacquers.—Pennsylvania Lubricating Co., Pittsburgh. Bulletin No. CP-2, dealing with the company's Penlaco, a rust-preventing paint oil; Pencan, an interior can lacquer, and Alumine, a vehicle for aluminum paint.

Desuperheaters.—Blaw-Knox Co., Pittsburgh. Bulletin 1417, illustrating the Blaw-Knox apparatus for reducing the temperature of superheated steam, giving a dry steam product.

EXPERIENCE

THE DECIDING FACTOR IN ELECTRIC STEEL QUALITY



MODERN ELECTRIC FURNACES...perfected melting practice...rigid metallurgical control...the finest of raw materials—these, of course, are vitally essential to the melting of fine electric furnace steels. But there is another requisite, a very important one—Experience. « The experience of Republic's electric furnace personnel is second to none in the industry. Manning Republic's electric furnaces are men who have been working together since 1916...men who whipped many of the early problems of electric furnace melting...men who have made thousands and thousands of tons of Agathon Electric Furnace Steels.

C E N T R A L A L L O Y D I V I S I O N

REPUBLIC STEEL
C O R P O R A T I O N
MASSILLON  OHIO



Training the Sales Telescope on Tomorrow's Markets

(Continued from page 575)

production—the over-expansion of plant capacity. But why was capacity over-expanded? Because manufacturers, after 1918, were obliged to look to increased turnover for a profit which they could not obtain on former volumes. Do you remember the days of “profitless prosperity?”

Why did they have to increase turnover, or volume, to make a profit? Simply because, in capitulating to the demands of the railroad unions in 1918, Director-General McAdoo suddenly threw out of balance a 30-year equilibrium between wages, productivity and the cost of living. From that time on, until 1929, under the spur of the abrupt rise in labor cost, the search for profits turned into a hectic scramble to increase volume of output. Increased volume, increased plants, increased capitalizations, inflation, false prosperity, won by going deeper and deeper into debt.

If you want convincing proof of this theory, you should examine the curves which chart the relation between average annual money wages and the cost of living. You will note if you do this that from 1889 up to 1919, manufacturing wages followed almost exactly the cost of living. There was a state of equilibrium established which enabled industry and business to cope with and to recover from all of the major and minor depressions which occurred during this 30-year period. But beginning with 1920, there is an abrupt change in the relation of the wage curve and the cost of living curve. The former rose and the latter fell. This divergence continued and in 1931 the manufacturing wage curve was still between 25 and 30 per cent higher than the previous stable long-term relationship.

Highs and Lows

We are going to find that this subject of wages has an intimate bearing upon our future success, or lack of it, in marketing products. When we know what wages should be and how to control them in relation to the cost of living we will have made a start on the problem of the sound financing of consumption. We need some super-economist to figure out a formula which will give us a better idea than we have now of the proper relation of total wages to gross manufacturing income and to cost of living, from the standpoint of the best interests of both production and consumption.

But wages can be too low as well as too high for public welfare. After the earthquake, come the looters. We need a firing squad to clean up the looters and the public enemies who are taking advantage of the present

employment situation to force wages down to coolie levels in some occupations. Adults working from 48 to 62½ hr. a week for from \$4 to \$12! You cannot hope to sell much to coolies. Unless the people who are responsible for this are brought to their senses, we are going to see minimum wage laws enacted, such as are now being seriously considered in New York State. I do not think that State laws will be beneficial, for such laws vary too much between States. If nothing else can put a stop to suicidal price cutting and the competitive wage slashing which follows it, a Federal minimum wage law may be the only solution.

The Dance of Death

This matter of price cutting is one of our serious immediate problems. The dance of death is going on now in all lines of business to the tune of the price-cutting tom-toms. The fools and scallawags who start the dance do not realize that eventually they themselves will be bled dry. For willy-nilly, their competitors must join the dance too or else be put out of business.

There will be no end to this vicious circle unless we determine to put an end to it. We may blame the buyer for taking advantage of the situation, but the cure lies primarily in the hands of the seller. It will not avail us to beseech Uncle Sam to raise the level in our price bucket, so long as we keep punching holes in the bottom of it.

Out of the Window With the Earthquake

Buying habits have been drastically upset by the convulsions that have altered our economic terra firma. Take, for example, the matter of market analysis. Prior to the big upset our sales statisticians were developing into keen-nosed data hounds. They could scent a promising statistic 20 years in the past, follow it up to the present and chase it into the future. We were becoming statistically minded in the sales sense. The statistical abstract of the Department of Commerce and the market researches made by associations and other bodies were the recognized



charts by which we plotted our courses. So many whisk brooms were bought in 1909, so many in 1914, and so many in 1919 and 1924; therefore we could safely make so many in 1929.

We were getting the many pieces of the market jig saw puzzle fitted together and it seemed to make a coherent picture. But the earthquakes that have occurred since 1929 have scrambled the picture and shaken many of the pieces out of the window. Even if we could find them and put them together again they would not make an intelligible whole.

Who can tell now, for example, what proportion of our total consumption can be bought next year or this year by wages, which financed more than half of our total consumption prior to 1929? Who can tell how future consumption is likely to be affected by the possible freezing of some of the six billion dollars in the 4000 banks which have not as yet been permitted to open? Who can tell how capital expenditures are going to compare, during the next few years, with those of previous decades? How much the farmer is going to be able to buy in the future, in relation to what he has bought in the past? How much California or Vermont is going to represent in purchasing power in relation to Massachusetts or Texas and what changes these relations represent to those existing in the past?

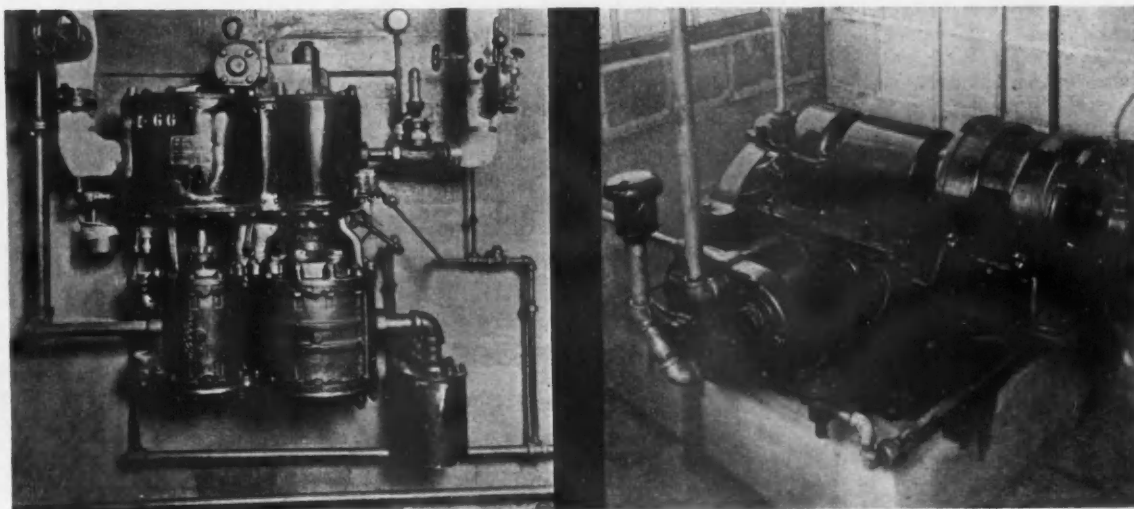
Past statistics can tell us little or nothing today. I doubt if these past market studies will be of much value to us tomorrow. For we are passing through a great period of change in markets as well as in men, motives and morals. Perhaps it will mean a complete shifting and shuffling of the cards in the new deal, so far as merchandising is concerned.

Yet we must hold fast to the principle of market analysis, even though our past studies may now be worse than useless. How can we plan intelligently without the basic essentials of a plan? As soon as the knowledge may be had, we must know what have been the alterations and shifts in consuming power. We must survey a new market map, not only for the United States but for world markets. It is too big a job to be done individually. It must be done by organizations. Part of it, perhaps, giving us the general outlines of the new market map, must be obtained through a special Government census. The more specific details must come through surveys by trade associations. Until this new map can be definitely outlined we must sail blind courses, more or less according to the dead reckoning of our sales mariners.

Bigness Not Now an Advantage

Sales telescopes which were trained upon the field of business before the earthquake centered primarily on the high peaks—the big fellows. We remember the familiar slogan, “Ten per cent of the units in our field do

WESTINGHOUSE AIR COMPRESSORS



FOR every conceivable pneumatic requirement in steel mill or industrial plant there is available a Westinghouse Air Compressor of suitable type and size—steam-driven or motor-driven . . . While there is diversity of form and purpose in these machines, there is uniformity in quality and performance. They possess unique design features and are well built. Reliability, economical operation, and unusually long life are their outstanding characteristics.

WESTINGHOUSE TRACTION BRAKE COMPANY
Industrial Division - - - - - Pittsburgh, Pa.

90 per cent of the total business." Once upon a time that was a good line for the advertising salesman.

It is not so good today, for several reasons. One is that the earthquakes have toppled some of the old familiar peaks and have raised some unfamiliar hills. Our smaller organizations, on the whole, have withstood the shocks better than most of the tremendously big ones. The new market map promises to have fewer of the great peaks and many more middle-sized mountains and hills.

Probably that is as it should be. We need greater diversification of buying power, a more even spread of prosperity between industrial units, just as it is said that we need a more equitable distribution of wealth between individuals. We are much safer with 100 customers on our list than ten.

Some of our industrial giants have grown top-heavy. Some have become hidebound. They have not responded quickly enough to changed conditions. In some industries these big brothers have not set the expected example of leadership in price policies, promotional work or personnel relations. Big ideas do not necessarily come from big heads.

Less Volume, More Profit

The absurdly inadequate volumes of business of today and of the past year will not last forever. We are not going to wither up and perish from industrial stagnation.

We have been fighting a long drawn out battle with John L. Depression. But it is not going to be a draw. My belief is that we have already fought and won the decisive round.

But when we complete the knockout, as we shall, do not expect, or hope, that it may bring back to us a prize in the form of the business volumes of 1929. The days of overinflated volume are done. May they rest in peace surmounted and safely held down by tombstones bearing the epitaph: "Here Lie the Follies of 1929."

It is better to be under-produced than over-produced. The farmers are learning that truth and we must learn it too. It is not healthy nor comfortable to be overdrawn at the bank of consumer demand.

The profit on sales today, in these days of well established factory costs, is not determined in our factories. It is determined by our salesmen. The verdict is spoken when the price is quoted and the order signed.

The world of production is now fairly well explored and charted. But the world of distribution is still a comparative wilderness. Up to now, we have been groping our way between its trees and through its underbrush, frightened by its bogey men which our imagination has magnified into monsters, and aiming shots at one another instead of joining in common cause.

The time has come now, when we must explore and conquer this unknown continent of distribution. We must clear away the trees and underbrush and build straight roads through tangled jungles. Most of all, we must stop shooting at one another and develop united effort toward common objectives.

The sales job of tomorrow will require bigger and better men than the sales job of yesterday. Where will we get them? The depression has been making them.

The trials that you have been experiencing have been tempering you for larger future responsibilities.

Standard Costs on the Instalment Plan

(Concluded from Page 581)

of the variation in the cost of producing the rough castings.

The production of machined castings represents the charge to the "Finished Parts" account, and as the previous inventory and the withdrawals are also priced at standard costs the remaining inventory is always stated at standard cost on the accounting records.

The final variation is determined in the account for the assembling of the parts for the given product-classification. The finished castings are charged to this account at standard. Purchased parts may be charged at actual, and the assembling labor and departmental expense are charged to this account at actual. The production of the finished product is priced at standard and the variation of actual from standard cost is determined in the same manner as for the castings in process and the machining of the castings.

The result of the foregoing plan is that whereas the current accounting procedures have been used to make the actual charges to all of the product classification accounts, the variations of the actual costs from the standard costs have been determined in the three conversion processes for the product classification which was selected as the basis for the development of the standard cost accounting procedure. These variations are disclosed in the profit and loss statement and the inventories pertaining to this product are all evaluated at standard cost. It appears therefore that it is perfectly feasible to adopt standard cost accounting procedures on the instalment plan and thus spread the total cost of a complete installation over a considerable period of time if desirable.

Effective March 30, drilled diamonds for wire-drawing dies, imported into the United Kingdom, were removed from the free list and made subject to a duty of 20 per cent under the general tariff.

Birth Control for New Enterprises

(Concluded from Page 584)

enterprises should render a favorable decision, not because it would enable a group of promoters or stockholders to make money, but only if it would serve the public interest. They should weigh the public interest against the private interest of the founders of the proposed venture before taking action.

When considering the public interest, too, it should not be overlooked that the stockholders, employees and their dependents, associated with the competing companies already established and whose incomes and livelihoods might be threatened by the activities of the newcomer, comprise a section of the public. With the mass of our population vitally interested in the stability of existing business enterprises, either as employees or as stockholders, it would seem that any measures assuring the protection of such companies against the unsettling effects of unbridled competition would be decidedly in the public interest.

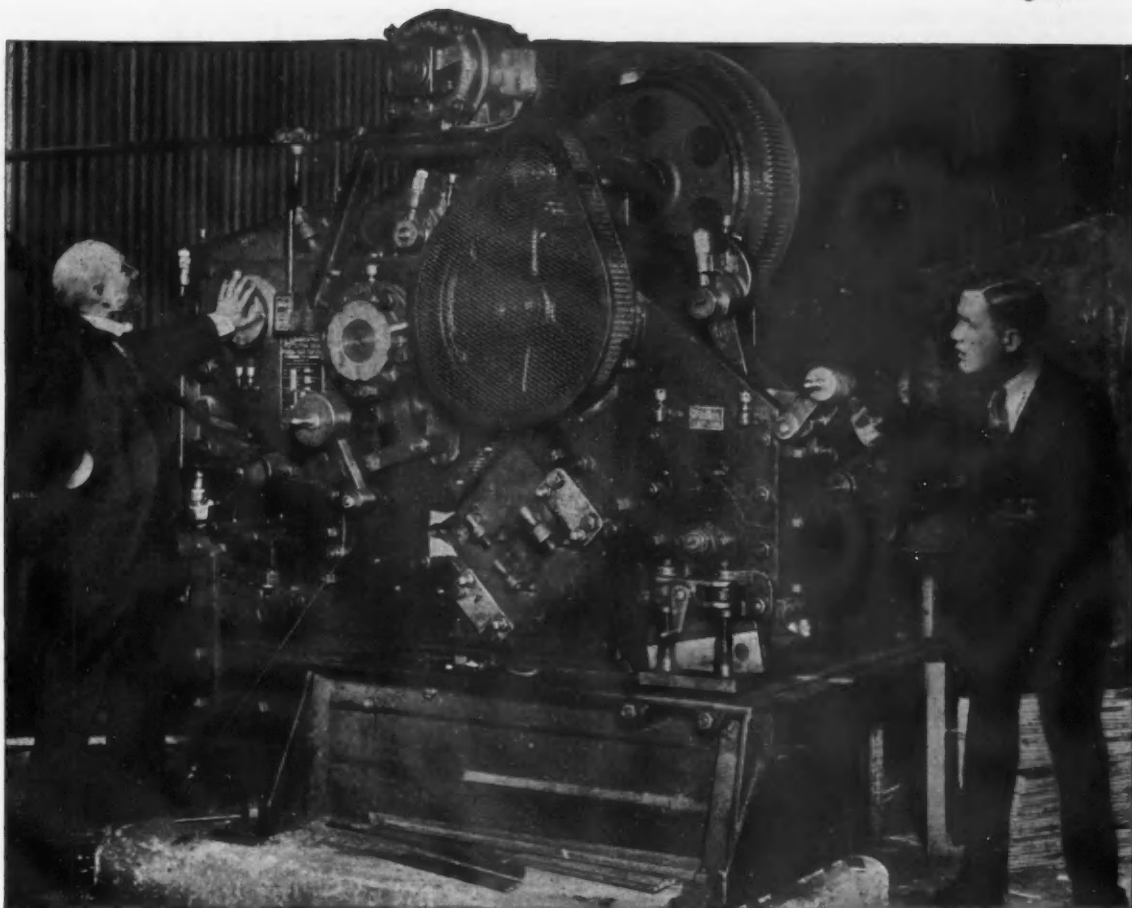
Would Promote Stability


A prominent member of the United States Supreme Court, recording a dissenting opinion in a recent case, expressed ideas very similar to those advocated here. Some astute business men feel the same way about it but hesitate to suggest such government control because of the danger of its being used for political purposes. That there might be some abuses of this nature must be conceded. However, it is safe to say that proper watchfulness on the part of local and national business associations could insure a high degree of fairness in the decisions of the regulatory commissions.

The restrictive measures here proposed apply only to new enterprises. Very little, if anything, could be done by law to prevent a going concern from increasing its production by building additional plants or installing labor-saving machinery. To attempt to do so would restrict progress. Such regulation would gradually come about among the established competitors in an industry if they were free of the unsettling influences of constantly increasing new competition.


If, in the opinion of the government, the members of any industry show a tendency to take unfair advantage of their market by boosting prices unwarrantedly, an effective club to use against them would be the threat to let down the bars to new competitors in that field.

The eighteenth annual international convention and "Informashow" of the National Association of Purchasing Agents will be held in the Hotel Statler, Boston, June 12, 13, 14 and 15.



 "A new deal, a better hand and a low ante. That's what we're getting by installing a 'Linc-Weld' motor on this combination slitting shear punch and bar cutter.

"If it were not a half-high torque type 'Linc-Weld' DL we would have had to buy a larger size motor. This new Deal saved us money on the original cost of that motor."

 "Don't forget that along with that new deal we get a nice stack of blue chips too. Chips in the form of lower current costs and a minimum peak load.

"Remember, the rating on a motor doesn't tell the whole story. This 'Linc-Weld' DL gives us the lowest cost per pound of material put through this press. After all, that's what counts. And if we are saving money, we are making money—getting more out of the pot. Incidentally, the repair man gets less.

"So you can bet your last dime on this new deal or any other deal with Lincoln—and win."

LINCOLN

THE LINCOLN ELECTRIC COMPANY, CLEVELAND, OHIO

Manufacturers of "Linc-Weld" Motors and "Stable-Arc" Welders

M 19

Production of Pig Iron and Ferroalloys in 1932

PRODUCTION of pig iron and ferroalloys in the United States in 1932, as officially reported by the American Iron and Steel Institute, was the smallest for any year since 1896. Last year's total of pig iron and ferroalloys was 8,781,453 tons. The 1932 total was reduced by more than 52 per cent from that of 1931.

Pennsylvania dropped from its time-honored position as the largest producer of pig iron to second place, first position having been taken by Ohio. Last year's total production in Ohio was 2,387,028 gross tons against 2,103,180 tons for Pennsylvania. Ohio's percentage of the country's total output was 27.92 compared with 24.6 for Pennsylvania. In the preceding year, Pennsylvania made 58.25 per cent of the country's total against 42.07 per cent for Ohio.

Figures compiled by the American Iron and Steel Institute for 1932 follow:

PRODUCTION OF PIG IRON AND FERRO-ALLOYS BY STATES, GROSS TONS, 1928-1932

States	1928	1929	1930	1931	1932
Mass., N. Y., N. J.	2,562,715	3,025,282	2,211,434	1,275,274	710,016
Pennsylvania	12,422,602	14,453,251	10,304,886	5,233,224	2,188,374
Maryland, Virginia	1,050,876	1,166,204	1,087,866	691,788	379,849
Alabama	2,546,009	2,709,881	2,394,725	1,671,205	667,374
West Va., Kentucky	864,922	864,201	864,824	755,919	305,659
Tennessee	110,837	138,753	138,753	138,753	138,753
Ohio	9,098,739	9,795,648	6,804,862	4,189,311	2,411,863
Illinois	3,942,412	4,357,971	3,344,674	1,964,735	919,280
Indiana, Michigan	4,583,065	5,085,615	3,934,212	2,327,839	1,034,801
Wisconsin, Minnesota	339,267	379,162	379,162	379,162	379,162
Iowa, Colo., Utah	634,270	638,015	804,686	317,059	164,237
Total	38,155,714	42,613,983	31,752,169	18,426,354	8,781,453
Pig iron	37,401,648	41,757,215	31,020,907	17,957,779	8,549,664
Ferro-alloys	754,066	856,768	731,262	468,575	231,789

PRODUCTION OF PIG IRON AND FERRO-ALLOYS BY STATES, SHOWING DECREASE, 1931-1932, GROSS TONS

States	1932	Per cent	1931	Per cent	Decrease	Per cent
Pig iron:						
Pennsylvania	2,103,180	24.60	5,037,672	28.05	2,934,492	58.25
Ohio	2,387,028	27.92	4,120,610	22.95	1,733,582	42.07
Indiana, Michigan	1,034,801	12.10	2,327,839	12.96	1,293,038	55.55
Illinois	919,280	10.75	1,964,735	10.94	1,045,455	53.21
Alabama	652,898	7.64	1,640,851	9.14	987,953	60.21
Mass., New York	624,141	7.30	1,149,677	6.40	525,536	45.71
Maryland, Virginia	680,774	7.96	1,419,987	7.91	739,213	52.06
West Va., Ky., Tenn.	147,562	1.73	296,408	1.65	148,846	50.22
Total pig iron	8,549,664	100.00	17,957,779	100.00	9,408,115	52.39
Ferro-alloys:						
Pennsylvania	85,194	36.75	195,552	41.73	110,358	56.43
New York, New Jersey	85,875	37.05	125,597	26.81	39,722	31.63
Ohio, Ill., Ia., Colo.	41,510	17.91	89,352	19.07	47,842	53.64
Md., Va., W. Va., Ala., Tenn.	19,210	8.29	58,074	12.39	38,864	66.92
Total ferro-alloys	231,789	100.00	468,575	100.00	236,786	50.53
Grand total	8,781,453		18,426,354		9,644,901	52.34
Pig iron	8,549,664	97.36	17,957,779	97.46	9,408,115	52.39
Ferro-alloys	231,789	2.64	468,575	2.54	236,786	50.53

PRODUCTION OF PIG IRON BY GRADES AND FERRO-ALLOYS BY KINDS, SHOWING DECREASE, 1931-1932, GROSS TONS

	1932	Per cent	1931	Per cent	Decrease	Per cent
Pig iron:						
Basic	5,074,427	59.35	10,174,447	56.66	5,100,020	50.13
Bessemer and low-phosphorus	2,220,468	25.97	4,635,648	25.81	2,415,180	52.10
Foundry	811,484	9.49	2,133,939	11.88	1,322,455	61.97
Malleable	419,723	4.91	945,664	5.27	525,941	55.62
Forge	1,558	.02	36,482	.20	34,924	95.73
All other pig iron	22,004	.26	31,599	.18	9,595	30.36
Total pig iron	8,549,664	100.00	17,957,779	100.00	9,408,115	52.39
Ferro-alloys:						
Ferro-manganese	93,644	40.40	234,808	50.11	141,164	60.12
Spiegel	124,708	53.80	211,284	45.09	86,576	40.98
All other ferro-alloys	13,437	5.80	22,483	4.80	9,046	40.23
Total ferro-alloys	231,789	100.00	468,575	100.00	236,786	50.53
Grand total	8,781,453		18,426,354		9,644,901	52.34

PIG IRON MADE FOR SALE BY GRADES AND BY STATES IN 1932, GROSS TONS

States	Basic	Bess. & low-phos.	Foundry	Malleable	Forge	All other pig iron	Total
New York, Md.	25,904	12,900	151,771	101,933		6,641	299,149
Pennsylvania	118,094	51,779	69,460	1,517			240,850
Alabama, Tenn.	12,953	174	346,874		1,558	1,593	363,152
Ohio	176,350	2,385	83,797	106,120		2,174	370,826
Ind., Illinois	108,877	13,419	103,967	182,152		3,007	411,422
Michigan, Iowa	2,829		23,815			1,503	28,147
Utah							
Total pig iron	445,007	80,657	779,694	391,722	1,558	14,918	1,713,546

METHODS BY WHICH PIG IRON AND FERRO-ALLOYS WERE CAST OR DELIVERED IN 1932, GROSS TONS

States	Molten condition	Sand cast	Machine cast	Chill cast	Direct castings	Total
New York, N. J.	583,899	42,529	457,193	4,986	148	1,088,755
Maryland	1,453,691	12,889	656,920	64,514	360	2,188,374
Pennsylvania	503,830	12,312	450,915	6,665	421	974,143
Virginia, West Va., Ala., Ky., Tenn.	1,789,895	5,857	613,488	107	2,516	2,411,863
Ohio	1,265,384	14,954	835,220		2,760	2,118,318
Ind., Ill., Mich., Iowa, Colo., Utah						
Total	5,596,699	88,541	3,013,736	76,272	6,205	8,781,453

METHODS BY WHICH BASIC PIG IRON WAS CAST OR DELIVERED IN 1932, GROSS TONS

States	Sand cast, machine cast, chill cast, etc.	Molten condition	Total
New York	116,473	211,099	327,572
Pennsylvania	495,407	1,048,360	1,543,767
Maryland, West Virginia, Kentucky, Ala.	103,880	712,238	816,118
Ohio	346,612	712,767	1,059,379
Ind., Ill., Mich., Colo., Utah	431,568	896,023	1,327,591
Total	1,493,940	3,580,487	5,074,427

METHODS BY WHICH BESSEMER AND LOW-PHOSPHORUS PIG IRON WERE CAST OR DELIVERED IN 1932, GROSS TONS

States	Sand cast, machine cast, chill cast, etc.	Molten condition	Total
New York, Maryland, Alabama	21,125	161,092	182,217
Pennsylvania	80,350	405,331	485,681
Ohio	65,848	1,057,082	1,122,930
Indiana, Illinois, Michigan	78,701	350,939	429,640
Total	246,024	1,974,444	2,220,468